20-01-00 9AM

Bob Cooper's

JANUARY 21 2000

SatFACTS

MONTHLY

Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

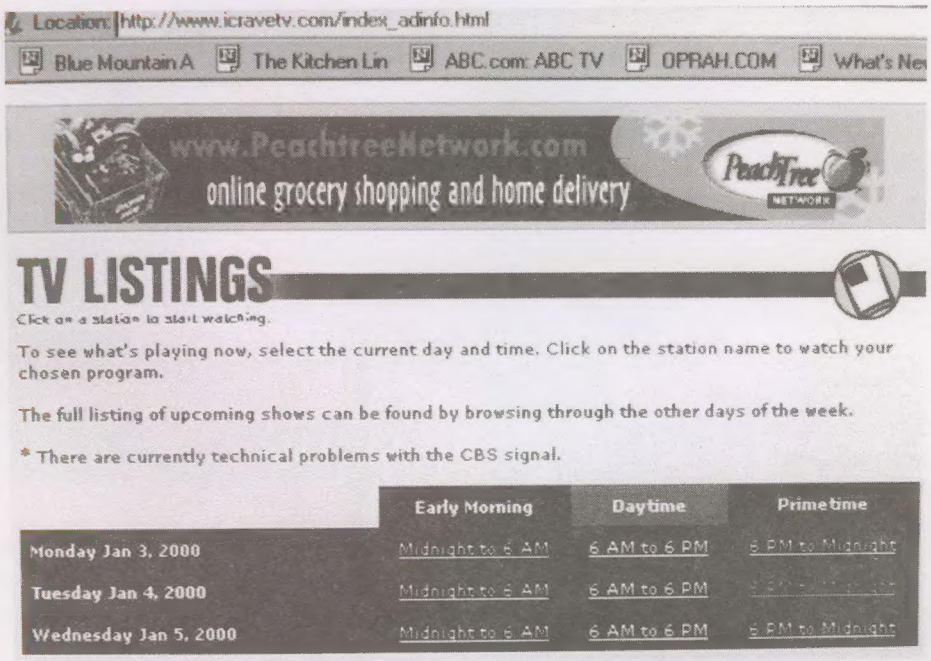
DVB-T FAILINGS and TVRO?

Terrestrial Interference Challenge

TPG's Run at the Golden Ring

✓ Latest Programmer News
✓ Latest Hardware News
✓ Latest SPACE Pacific Reports
✓ Cable TV Connection

Vol. 6 ◆ No. 65
Price Per Copy:
NZ$9/A$10/US$7



When quality, strength, and accuracy are your main requirements, **Paraclipse** antennas are your first choice.

Only **Paraclipse** offers such variety; four distinctly different series:
the Truss-Ribbed Classic,
the Courier Deliverable Eclipse,
the Stretch Formed Hydro,
the Commercial Patriot.

Every **Paraclipse** model sets the industry standard in its class, worldwide.

Distributed in Australia & the Pacific by

SATECH Satellite Communication Technology Pty. Ltd.
18/477 Warrigal Rd, Moorabbin East, Victoria, Australia 3189
tel 61-3-9553-3399
fax 61-3-9553-3393

Paraclipse
HIGH PERFORMANCE ANTENNAS

MADE IN AMERICA

Paraclipse Inc.
2271 29th Avenue East, Columbus, Nebraska USA 68601
Telephone: (402) 563-3625 Fax: (402) 564-2109

SPACE PACIFIC REFERENCE MATERIALS

(updated January 21, 2000)

to help you do a better job, profitably

Some items in limited quantity (marked LtdQty**); many have special SPACE member discounts**

SPACE Pacific Report (# 9901, 9902, 9903, 9904)

The television programme, direct to you from digital master on E240 VHS tape, PAL format of course. Show 9901: "It is your signal, too" and "Fun and games with the spectrum analyser." Show 9902: "Feeds and LNBs" - understanding how products differ. And, "Mark Long's Thumbnail History of home satellite TV" featuring the real pioneers of the 70s and 80s! Show 9903: "Dish antenna critique ," why some dishes work better than others, plus Mark Long on installing your own dish, and, Richard Brooks on PVRs. Show 9904: "Who buys DTH systems?" explores the marketplace, plus, "Understanding Tiny Parts" looks at connectors, line-amps and splitters. Four hours as currently running on Mediasat & Westlink- digital mastered to you for the exceptional price of $55 including shipping and two bonus items - "Satellite Television (The Booklet)" featuring material by Sir Arthur C. Clarke, and, the infamous CMT satellite pencil-writer! (see order form, below). In stock, shipped within 72 hours. (No SPACE discount)

Shows 9905, 9906, 9907, 9908 & 9909

The television programme - the latest releases (even before they appear on Mediasat, Westlink!). As above. Show 9905: Robin Colquhoun and the Dr Overflow software for the Nokia; Show 9906: How the uplink works - possibly the best programme topic ever created. Show 9907: Part two of uplink. Show 9908: Instructor Mark Long's "Digital Basics." Show 9909: Mark Long's "Installation Basics" with emphasis on Ku service. Shows 9905, 6,7, & 8 **now being shipped**. $60, no SPACE discount.

World Sat TV '92

Close out - a few copies remaining! All of the basic fundamentals are here, at a price that is too good to be true. Hey - the quantity is very limited (LtdQty) and we need to clear out the shelf space. $10 and if you are a SPACE Member, it comes down 30% to $7! Having a complete satellite TV reference book doesn't get any cheaper than this.

TB 9404 DTH Systems

Direct to Home: Satellite System Installation Techniques. There are many-many NEW people getting into home satellite system installation. And we receive several calls each day asking us to point them at a "basic tutorial" that will explain how a home dish system works, how you install it for proper performance. This is it. Without question, the very best *quick* tutorial on what a home dish system is, how it works, where the problems develop. If you are new to the DTH field, buy this and commit it to memory. Very slight New Zealand bias, not enough to hurt its value world-wide. And if you are looking into multi-set installations such as motels and hotels and condominiums, also order TB 9405 'SMATV Systems' (below; the pair make it painfully clear where mistakes are commonly made). Also see SatFACTS October, November and this issue - for RF Distribution System articles. TB9404 originally prepared by Coop for an Asian DTH technology conference, LtdQty $10 (SPACE discount).

TB 9405 SMATV Systems

Satellite to room - Commercial SMATV (Satellite) Dish Installations. The easy part is the satellite dish or dishes. The difficult challenge is getting all of those signals - including the terrestrials - balanced and into every room and each TV outlet at the proper level. If you plan to do multiple-outlet systems, start here with this Coop written tutorial. LtdQty and only $10 per copy while they last! (SPACE discount)

Nelson Parabolic Manual

The Nelson Parabolic TVRO Manual. If you are the type of person who wants to build your own dish (up to 3.7m in size), or, you simply want to understand why some dishes work better than others, this step-by-step "how to build a dish" manual is the "Bible" of an industry. Nelson Ethier was a perfectionist and brilliant with hand tools. It shows here - the ultimate backyard project! Half original price at $15, LtdQty, SPACE discount applies.

SPACE Pacific Order Form (also see SPECIAL PACKAGES on reverse side)

Please send the following:

☐ SPACE Pacific Report - 9901-9904/ $55 (no discount); ☐ Shows 9905-9908/ $60 (no discount); ☐ Package deal - 9901-9908 (**2 tapes**)/ $105 (no discount); ☐ World Sat TV-'92/$10; ☐TB 9404 - DTH Systems/$10; ☐ TB 9405 - SMATV Systems/$10; ☐ Nelson Parabolic TVRO Manual/$15. Total of order - $_____. If current SPACE member, multiply by 0.7 (70%) and write discounted total here: $_____

I wish to pay this by ☐ cheque (enclosed) ☐ VISA card ☐ Mastercard

Card number __ __ __ __ - __ __ __ __ - __ __ __ __ - __ __ __ __ expires ____/____

Ship to (name as it appears on card):

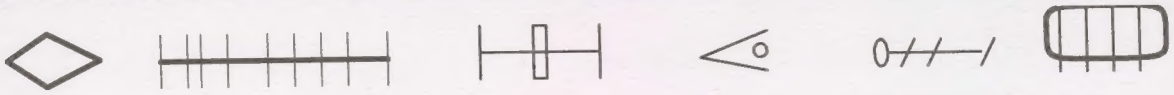
_____ Company _____

Mailing address _____

Town/city _____ _____ _____

Your signature: _____

SPACE Pacific Terrestrial TV Reference Materials



Each of these editions researched, created by "Coop" to help you solve tough aerial problems

TB 9301	**Tech Bulletin 9301**. *Co-Channel & Antenna Phasing*. How to grow a single antenna (Yagi, broadband antenna) into a complex array to greatly increase gain, sharpen receiving pattern to eliminate co (same) channel interference. Totally hands-on, very practical, up-to-date. Go from novice to professional!
TB 9302	**Tech Bulletin 9302**. *Weak Signal Reception Techniques*. If one cut-to-channel (Yagi) antenna won't do the job, will 2, 4 or 8??? How about 16? Stacking antennas, mating with carefully selected masthead amps, is an art. This explains how to do it for professional results up to 300 km from TV stations.
TB 9303	**Tech Bulletin 9303**. *UHF - The Frontier*. Using parabolic style antennas surfaced with low-cost poultry mesh, build UHF dishes up to 40 feet in size to extend UHF off-air reception out to 300 km. And - learn the tricks to "squirt" signals from a hilltop to a valley below using low-cost receiving equipment.
TB 9304	**Tech Bulletin 9304**. *Beating Noise Interference & Combining Cross-Pole Signals*. When TV and FM signals are weak, man-made interference from appliances, power lines can kill reception. Step-by-step instruction for identifying, locating, fixing noise sources + unique method of combining cross-pole TV signals.
TB 9305	**Tech Bulletin 9305**. *Cable Television - Fact & Fiction*. The story of how a cable TV system is designed, built, operated. The perfect "So this is how it works!" report. Who knows - you might even like the concept so well you take out a mortgage on your home and wire your town!
Lost Art	**Lost Art of Rhombic Antennas** *-27 dB of gain VHF & UHF*. Everything you need to know to build the most sensitive VHF-UHF receiving antenna ever created. Rhombics are used for virtually all long haul military circuits. Includes super-Rhombic LaPorte design. 300 km? A piece of cake!
40' Dishes	**20 to 40' Poultry Mesh (Chicken Wire) Parabolics**. Complete instructions to build UHF-TV off-air reception antenna system combines low cost reflector materials with Redwood or other durable "struts." 20 to 25 dB of gain, out to 300 km UHF reception. A backyard project with earnings potential.
Half-Bolics	**World-Famous Frias Half-Bolic Reflector**. Amazing design allows simultaneous reception over sizeable arc of transmission locations. City grade (80 dBuV) reception from distances of 280 km on VHF (45 MHz) through UHF (900 MHz). This is huge, but easily the best all-around deep-deep fringe antenna system.
Raw Video	**SPRSCS '99**. SPACE shot many hours of video during SPRSCS '99 to prepare for the (now available) 9901 - 9904 one-hour TV shows. In "Raw Video" you have everything shot, before editing, including material done by Robin Colquhoun for the Dr Overflow software explanation - all reshoots and mistakes! 4 hours, PAL.

ORDER FORM - and special discount packages

Please send the following:

☐ TB 9301/$10; ☐ TB 9302/$10; ☐ TB 9303/$10; ☐ TB 9304/$10; ☐ TB 9305/$10; ☐ Lost Art-Rhombic/$20; ☐ 20-40' Dishes/$20; ☐ Frias Half-Bolic/$20 - or

☐ TB9301/9302/9303/9304/9305 - $40 -or- ☐ Rhombic/ 20-40' Dishes/ Half Bolics - $50 -or-

☐ TB9301/9302/9303/9304/9305 + Rhombic/20-40' Dishes/Half Bolics - $80.

Video: ☐ Space Raw Video/$35: ☐ SPACE Videos - 9901-9908 + Raw Video/**3 tapes** $135.

Total of order - $_____; If current SPACE member, multiply total by 0.7 to obtain discount price (NOTE: No discount applies to Raw Video or SPACE Pacific Report) - new discount total $_____ . I wish to pay this by ☐ Cheque (enclosed) ☐ VISA ☐ Mastercard

Card number _ _ _ _ - _ _ _ _ - _ _ _ _ - _ _ _ _ expires ___/___

Ship to (name as it appears on card)

_____ Company _____

Mailing address _____

Town/city _____ _____ _____

your signature _____

Return to: SPACE Pacific, PO Box 30, Mangonui, Far North, New Zealand or fax to 64-9-406-1083

SatFACTS
MONTHLY

ISSN 1174-0779

is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no long define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

Editor/Publisher
Robert B. Cooper (ZL4AAA)
Office Manager
Gay V. Cooper (ZL1GG)

Reaching SatFACTS
Tel: 64-9-406-0651
Fax: 64-9-406-1083
Mail: PO Box 330
Mangonui, Far North
New Zealand
Email -Skyking@clear.net.nz
http://www.satfacts.kwikkopy.co.nz

Subscription Rates
Within NZ: $60 p/y
Australia: AV-COMM Pty Ltd, PO Box 225, Balgowlah, NSW 2093
61-2-9949-7417
Elsewhere: US$60 p/y
All copies sent via airmail fast post world-wide

COOP'S COMMENT

January 21, 2000

Note: This issue of SF is dated January 21 - because our printer takes a generous holiday each Christmas. On top of the "late" delivery to many subscribers for the December issue, it might appear that we are slipping. *We are not*. The Christmas mail delay was simply the result of too many pieces of mail shoved into an over loaded mail handling system. Postal employees seem not to actually look at the "AIRPOST/FAST POST" sticker on our envelopes, assuming (incorrectly) if the envelope is large, the postage rate must be slow and slower. I want to assure you we do everything humanly possible to get your copy to you via the fastest possible delivery system available each and every month. If we screw up, we are honest enough to admit it. This month (and December) was not such an occurrence.

The status of digital video broadcasting in the terrestrial format is in shambles. DVB-T grew out of more than five years of intensive study in Europe and North America. The Europeans selected one transmission standard (COFDM) and the Americans another (8-VSB). Under some circumstances, COFDM outperforms 8-VSB. In other situations, 8-VSB is better. But - both have serious reception problems and neither is perfect.

The telecasters are being told, in Australia, they must convert to digital; to a special form of digital known as high definition TV (HDTV) and simultaneously to standard definition digital (SDTV). Most telecasters understand this is the largest financial risk they have ever taken. If HDTV fails to attract consumer interest, billions of dollars will have been spent for naught. SDTV, meanwhile, is a "patch" on a problem. The problem is the uncertain public acceptance of HDTV and the very high costs involved. Australian politicians, ever anxious to appear progressive and smart, have fallen into a technical trap of their own making.

You are a "satellite guy" and many of you have told me, "*Why should I given a flying F- - - what happens to DVB-T - I'm a satellite guy!!!*" Think it out. If HDTV fails, DVB-T will falter, sputter and grind to an economic halt. Sometime in 2003-2004, the public votes will be counted and if HDTV has been the fiasco we anticipate, broadcasters will be faced with reconverting their failed HDTV equipment to an expanded SDTV. By then the politicians will have disappeared from the scene and the public will be left with all of the technical problems of COFDM in SDTV format.

Between 2000 and 2004, the satellite world - which already uses SDTV - and the Internet world - which is rapidly ironing out the technical difficulties of SDTV through telephone lines - will have made great progress. As we report here, the first Internet 17 TV channel Web site is operating and as Ron Theaker of IHUG penned to us January 10th - "*It is almost real time video with acceptable audio. Even at 80 kbps I watched part of a movie on* (Toronto station) *CITY-TV and then the end of an NFL playoff on Global. You get occasional hiccups but once on line it seems very good. It does some HD buffering to achieve this so you have to be a little patient when it loads. Altogether, I am most impressed.*" This from a very critical professional in the world of Internet TV - the Manager of iHUG Digital.

Ignoring the promise of delivering Internet TV will be a mistake. Toronto, Ontario, Canada is a fair way around the world from Theaker's Auckland office. He was down loading the Toronto service through IHUG's satellite service. Those two words - "Internet" and "satellite" are destined to change the way we and our customers watch TV in the next few years. And DVB-T, with its political and engineering mistakes, will be the loser.

-ON THE COVER-

Internet TV? It's here and there is a satellite connection. (p. 6).

LETTERS

Moving a dish

"Our challenge was to move a 4.8m/16' dish across Port Pirie - intact. We lowered the dish onto a tandem trailer, disconnected the hub, stood the dish up on the trailer (with lots of help!) and used the mounting post as a tripod to support the antenna on the trailer. And we used lots of rope and colourful adjectives to secure it down for the trip across town. The driver with a support vehicle rounded the first corner and OOP's - some 'careless person' left the telephone and power lines hanging down too close to the ground. OK - find a piece of PVC conduit and shove them up out of the way to get under! This was but the first of many such stops for gentle rearranging of the utility lines. After plenty of sidewalk superintendents 'helped' us with a combination of strange stares and seldom intelligent questions, we arrived at the site. Three 'strong Australians' lifted the dish from the trailer to the new mount where new owner Owen Crocker decorated it with Christmas tree lights to the amusement of his neighbours."

David Carwana, Tocsin Systems, Australia

Looking for specific LNBF product

"With the rapid take-up of the Canal+/RFO satellite bouquet here in New Caledonia, our firm is heavily involved in wiring of apartment, motel and multiple dwelling blocks with L-band distribution systems. What I cannot locate are 10.6 GHz local oscillator LNBFs - no 22 kHz, no voltage switching, no second LO. Can anyone help?"

Steffen Holzt, E-mail antenne-cal@canl.nc,
fax ++687-41.52.40 (New Caledonia)

Who owns the cards?

"Reference the letter appearing in December SF concerning ownership of Optus Aurora cards. What's the big deal? Surprise - all STAR TV Asia cards are owned by the service provider. Always have been, always will be - one step of many to prevent wholesale piracy of the service."

STR Ltd, Hong Kong

The beef with Optus is their card distributors write a "sold invoice" for each card. Selling something usually suggests ownership passes as well.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

January 21, 2000

icraveTV.com Web site delivering 17 USA and Canadian FTA television service channels (p. 1, 6) has a very simple way of screening out who uses their service. Copyright dictates that they "limit" users to people living in Canada and to "qualify" as a Canadian you are asked for your telephone area code number. 604 is British Columbia - we like that number. But sooner or later icraveTV will have to take additional steps to keep out foreign users. Your Internet URL address would be a simple way to police this of course - which will then lead to an enterprising Canadian offering you a Canadian URL address through a server in that country. And the beat goes on.

French television and radio service RFO is pushing hard on the islands of the Pacific to "come together to create an all-Pacific international television service." RFO's director for international relations argues that virtually everything seen on television in the Pacific originates "north of the equator" and carries "biases which do not fit into the culture and lifestyle of the Pacific." He proposes that the recently launched Canal+/RFO satellite bouquet on Intelsat 180E be expanded to have regular input from television broadcasters in Fiji, Tonga, Samoa and elsewhere. The RFO New Caledonia contribution, scheduled to launch in March on the bouquet, will be linked from Noumea back to Paris using (BT) undersea fibre optic cable, and then plugged into the Canal+ bouquet there for retransmission back into the Pacific. "A television station that shuts itself off from the world will die" was the message to delegates from 21 Pacific countries attending a Noumea conference. "We must open our doors and windows, open our islands and our countries." See SatFACTS At-Sign-Off, p. 32 for December for our own take on this challenge.

STAR TV Sport on As3 - FTA. Enjoy it while you can. New plan - to gradually convert all English language audio to Mandarin with goal of no English at all by mid year. Let's see - where is that Mandarin language-at-home course book???

What's the excitement? When BSkyB (UK) launched their "Open TV" connection to Internet, the anticipation was only a small percentage of BSkyB viewers would use the extra "free" service (it comes as a bonus to being a BSkyB satellite subscriber). Wrong. Open TV launched in October, and more than 30% of BSkyB's digital satellite subscribers signed up for e-mail service - more than 350,000 in all. On-line product sales - of which BSkyB gets a percentage of the selling price each and every time - added up to more than a million pounds a week running up to Christmas - 127,767 orders through the system. There is more. 45% of the homes who registered for the free Internet and E-mail service use it at least once per week, averaging 15 minutes on-line each use. E-commerce is obviously alive and well in the UK with that magic marriage of two key words - "Internet" and "satellite."

We missed one. Recall the mess when EBB changed their data stream November 23? Of course you do. What we didn't know at the time was Dr. Burkhard Nowotny, head man at Deutsche Welle, was in Sydney staying at Top of the Town Hotel through the 25th. His phone would have rung off the hook if that had been better announced!

Sky NZ TV carriage of national FTA network TV3 launched on schedule 1 January. No, TV4 from same shop will not be carried and TV3 agreement only runs until December 31, 2001.

If CNN goes down on you, go to CNN.com website, left hand side of page locate "Distribution updates" for latest word from network headquarters concerning satellite problems.

New EP-313 complete Television Analyser

Complete range of TV measurement funtions for 45-2,150MHz frequency range

NEW!

Narrow 100KHz resolution bandwidth shows detailed Spectrum on all bands
100 preset storage locations and factory pre-set of World channel plans
Mono and Stereo Vision to Audio ratios measured automatically
On Screen Display of all measurement and set up parameters
Level displays digitally to .1 of a dB, with bar graph and tone
9 different Spectrum and Expanded Spectrum span views
Automatic Carrier to Noise Ratio measurement
Calibrated first for flatness and then for level
Revolutionary low price point

Unahm developed the new EP-313 in response to demand for a high quality precision instrument for terrestrial and satellite TV measurements that won't break the bank. Finding signals anywhere in the 45 to 2,150MHz range is easy in Spectrum mode, and sensitivity down to 20dBµV allows the weakest of TV signals to be detected. Frequency and level readings can be taken at all times, regardless of operational mode. The 100mm CRT with On Screen Display (OSD) provides access to a huge range of functions. Audio Tone and Bar graph simplify peaking an aerial or dish for maximum signal strength. Spectrum and Expanded Spectrum modes are provided and frequency marker is easy to see regardless of state. In Narrow a 100Khz RBW filter clearly shows detail including Stereo TV audio sub-carriers, all the way to 2,150MHz. Optimizing LNB skew is a snap! Carrier to Noise Ratio, Vision to Audio ratio and Digital Channel Power measurements are automatic, and display digitally. TV channel plans are factory preset enabling tuning by CHannel almost anywhere. Often used channels can be stored in 100 PReset positions along with information such as LNB voltage, satellite audio sub-carrier, video polarity, 22kHz generator and TV standard, saving time measuring TV distribution systems. EP-313 can also tune FRequency by direct entry or in steps of your choice. Full analogue TV picture can be combined with either level bar graph or sync pulse and colour burst display. TV AM and FM audio sub-carrier demodulation enable FM radio and almost any analogue audio to be heard. Teletext is included as standard. Included mains power supply will run the EP313 continuously, and recharge the optional internal 6.5Ahr high capacity sealed lead-acid battery overnight for over two hours of continuous field use. The battery can be topped up from many L.V. sources including cigarette lighters. A handsome field carry bag with accessory pocket and shoulder strap is included.

UNAOHM

Another quality product from
Lacey's Australia

12 Kitson St. Frankston VIC 3199
Tel:(03) 9783 2388 Fax:(03) 9783 5767
e-mail: placey@netlink.com.au

Aurora card snafu

"Yes, there is confusion about what the two versions of the Aurora smart card are capable of doing. Fact: The ACS 1.2 card can hold only 20 different channel id authorisations for provider 10 (that's Aurora). Aurora's activation centre doubles up on channel IDs so that one logical channel id will actually authorise more than one physical TV or radio service. Provider 0 (Austar/ Foxtel) on ACS 1.2 cards are capable of holding 100 channel IDs. It is a different story with the ACS 1.6 cards. The Foxtel ACS 1.6 cards can hold 60 channels for both provider 0 and 10. The (one) Optus 1.6 card I have interrogated, one assigned to a hotel, has room for 3 providers with up to 32 channels each."

BH, Australia

"After reading December SatFACTS I would argue with the 'All smart cards remain the property of Optus.' Which smart cards are they talking about? Certainly not the Aurora ones I have bought! The ones I 'bought" never came with any such 'conditions' attached and in fact I even paid 'sales tax' on them. If I did not 'buy' them. how can I be charged 'sales tax?' The cards themselves contain no such statement saying they remain the property of Optus. So what happens if it gets lost/stolen/broken? Will Optus replace it free of charge? I think not. I'd love to see them try to claim them back."

EI, Australia via E-mail

Will DVB-T's nightmare go unnoticed?

"How will we survive the changeover to local digital TV reception? Where, in the past, if a plane flies over you have modest ghosting of the image, but with digital you have total picture and sound loss. In a fringe area or when a car with bad spark plugs drives by, you have break up or interference - with digital you have nothing, no reception at all. If you live in an airport take off and landing corridor, is government prepared to supply compensation in the form of daily video tapes? I wonder how the public will accept this major step backwards and whether they will be 'understanding' of the people who made these highly controversial technical decisions. Is this a nightmare or will it simply go by as unnoticed?"

Tony Drexel, Free to Air Satellite, South Australia

It will be difficult to not notice. Unless of course by the time DVB-T is the only TV left broadcasting FTA, all of the viewers have moved to satellite or Internet TV. Will the last analogue FTA viewer please shut down the CRT?

An insult???

"My latest E-mail from Boomerang TV includes the following line concerning equipment installation:

'TPG will offer the option to either have the equipment professionally installed or installed by yourself. A capable handyman should have no problems installing the equipment.'

"Capable handyman??? Give me a break! "

Patrick Middleton, Advanced Circuit Technologies

A suggestion. Tell them your fee to do a new install is $100, or, $150 to trouble shoot an installation done be a do-it-yourself capable handyman!

HARDWARE EQUIPMENT PARTS UPDATE

JANUARY 21, 2000

MadMax released on Monday January 10 according to his wife in Cape Town, hopes to be home in South Africa on day this issue of SatFACTS goes into mails. As of the 14th, "*Rolf expects to have a cell phone today or tomorrow, the German Embassy is holding his passport and will relinquish it to him when paperwork covering latest fine of 150,000 Baht* (US$3571) *is completed.*" Back on 31 December during the Y2K period, Australian card enthusiasts reported a "strange" new offer appearing on http://members.xoom.com/satsystems/australi.htm which included piracy cards sent COD provided user revealed "real, valid E-mail address." Discussion groups quickly branded this site as a decoy and suggested "entrapment of the unwary" was the purpose. Details of court settlement of second case brought against MM/Rolf Deubel were not available as this issue of SatFACTS headed for the printer. Updates - if any - will be posted on our own Web site - http://www.satfacts.kwikopy.co.nz.

Digital standard? There was a narrow window in time when one unified standard for all DVB could have been adopted, to the advantage of both the television and the computer folks. As the computer designers have so aptly shown us, there is no longer a need to align frame/field rates with the (AC) mains frequency which at one point during development provided a strong argument for slightly different standards for discrete points on the globe. DVB - unfortunately, with 20-20 hindsight, was basically an European creation, and it looked no further afield than the needs of Europe. DVB as it is now established makes it difficult - some would say impossible - to deal with the character set problem unless the SI (system information) you want just happens to be in Latin/Cryllic/Greek alphabets. DVB totally passed over the needs of the Japanese, Chinese and other "character-alphabets" and now we see each developing their own SI approach. Standards for DVB? Only if you are white and/or European!

What's in a name? Digi**match**(r) is from Matchmaster and claims to be Australia's "First UHF/VHF Digital & Analogue TV Antenna." Antenna claims include "COFDM Compatible" which could mean someone actually sat down and analysed the problems associated with DVB-T reception. Or, it could be an advertising phrase deigned to give confidence to new antenna buyers the antenna will not be outmoded by the transition to digital. What are the desirable characteristics of a DVB-T antenna? Still early days, but extremely flat match (no gain or loss of gain "spikes" inside a TV channel passband), extraordinary front to back ratio to knock down reflected signals from the rear, tight forward lobe to eliminate multi-path from objects in front of the antenna head the list.

Boomerang TV - it always comes back. TPG Internet group testing on PAS-8 12.725Hz into Australia has some very strict requirements if you wish to be an installer. *First*, you have to agree to work for around $60 per install. *Next*, you will have to purchase a crimping tool for F connectors. That's the end of the requirements although they do list as "*Optional - Satellite Finder in order to make the pointing process easier - cost $60.*" They are selling the complete DTH system directly to customers, will ship to the customer, and he locates a "qualified" installer from a Web site (to be established) where those with crimping tools will be listed. Boomerang claims, "*Our PAS-8 signal is much stronger than Austar or Foxtel, anyone with experience installing a TV aerial can do this.*" They are also suggesting you can use ex-Galaxy 60/65/72cm dishes because of the satellite's "great signal strength." Parameters: Well, the FEC is 7/8. Do you think they understand what that means??? (If *you* have your *very own crimping tool*, contact CM Lai at 02-9850-0893 or E-mail cmlai@tpg.com.au.)

There have been some incredible mistakes here-

STATUS of DVB-T and the IMPACT ON SATELLITE TV

1999 was a bad year for digital television if you are in the terrestrial TV business. Much of the world was looking to the excitement and development of high definition digital terrestrial television in the United States as a "model" for the growth of digital terrestrial (called DVB-T in the trade). What happened has bordered on the edge of insanity. In a short sentence -

DVB-T, HDTV in the USA, does not work, properly.

Now, before you shrug off that sentence with some sarcastic suggestion that this is an "American problem" that has no direct impact on digital television in your country, consider this.

1) The USA is the largest television "market" in the world, consuming 25,000,000 new TV receivers in 1999. This means the world's TV manufacturers design receivers first and foremost for America, and then as their resources permit, modify those receiver designs to be sold in other portions of the world where non-American standards apply. If the American system is "broken," design and production of digital TV sets for the balance of the world stops. Immediately.

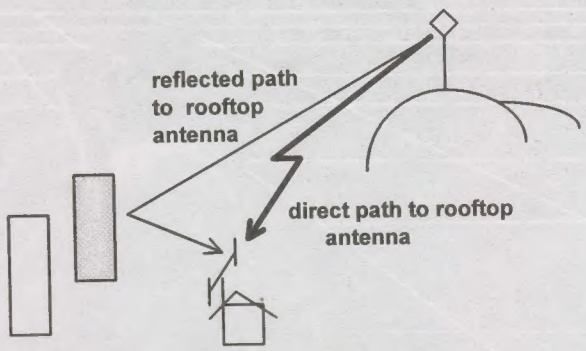
2) The American HDTV technical format was to be the "model" for many other countries planning HDTV (for example, Japan). In the classic domino effect, if DVB-T has technical problems in the USA, sooner or later the ripple effect will get to most of us no matter where we live.

3) The technical problems with the American HDTV transmission system are not unique to that system - to a lesser but still real extent, a totally different British approach to digital television is also experiencing its own version of problems.

The Problems

Unlike analogue transmission schemes, digital is extremely sensitive to repetitive "echoes." An echo in analogue is known as a "ghost" (image) which simply means there are two or more totally separate images on the screen simultaneously. One arrives at the receiving location following a "direct" path from the transmitter - one or more "ghost" or echoes arrive at the receiver after travelling in a slightly different direction and then being bounced (reflected, ricocheted) to the receiving location. The direct path arrives first, the ghost paths are slightly delayed in time because they travel further along a deviated route.

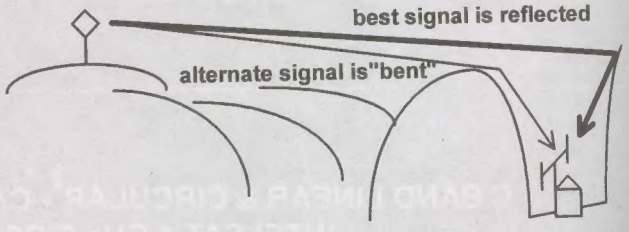
An analogue "ghost" appears as an extra image on the screen, the TV set first processes the direct signal that has travelled over the most direct route, then milliseconds later it processes the same information a second (and third) time from the reflected, longer path. The effect with analogue is two or more distinct images on the screen. A ghostly analogue signal is someplace between "not perfect" and "not watchable" depending upon the extent of the ghosting and the overall signal level. Ghosts occur in two separate environments. In regions nearby to the TV transmitter, with hundreds of



kilowatts or megawatts of transmitted power, virtually anything that is reflective to VHF and UHF signals can become a source of ghosts. Generally speaking, within 30 to 50 kilometres of a high power transmitter, ghosts are the result of too much signal in the air - so much that it bounces from solid objects. A metal roof on a neighbour's home is a solid reflective object. So too is a high rise building, a water tank, even a hill nearby. At high band VHF (band III - 174-230 MHz) and UHF, even densely foliated trees are a reflective surface.

The second category of ghosting occurs in weaker signal areas where there is hilly or rough terrain. Homes located at the base of a tall hill or surrounded by hills have no real "direct" path to the transmitter - the terrain acts as a block or shield. The signals that do arrive in these unfortunate locations are "scattered" by the terrain, bouncing several times to arrive at the receiving aerial. If there is but one single reflection point that bounces signals into a disadvantaged location, you can usually live with the effect. When there are two or more separate "bounce" paths involved, one will always be slightly more direct (shorter) than the others and the offset or difference between the path lengths appears as ghosting on the screen.

So what does this have to do with digital television? *Everything*. Because as soon as there is a ghost path between the transmitter and the receiver, the digital reception simply stops. Present day American HDTV receivers cannot cope with a digital data stream that is corrupted by ghosts. Why?



There are many locations where the best (cleanest, strongest) signal is actually on a reflected path. Reflected paths are not necessarily bad - only when there are many paths present at same location simultaneously

Clean data stream: Y N Y Y Y N N N Y Y Y N N Y Y Y N N N N N N Y Y Y Y N Y Y Y Y Y Y Y N N N Y Y Y Y Y Y N N N N N N Y
Corrupted stream: Y N Y Y ? ? ? N Y Y Y N N Y ? ? ? N N N N ? N Y Y Y Y N Y Y Y Y Y ? ? ? ? N N Y Y Y Y Y Y N N N N N N Y
Corrected stream: Y N Y Y Y N N N Y Y Y N N Y ? Y N N N N N N Y Y Y Y N Y Y Y Y Y Y ? N N N Y Y Y Y Y Y N N N N N N Y

Note that corrections do not eliminate ALL errors in transmission

Too many errors: ?

When there are too many errors the reception simply stops leaving the viewer with a blue screen or on screen advisory

Unlike the analogue transmission, the digital receiver works by using a built-in "error correction system" (FEC in the satellite world). Even in our satellite patch, transmission errors occur. The modern digital receiver locates the errors and makes an on the fly decision how it will deal with the error(s). Forward Error Correction depends upon a constant flow of digital bits - the so-called "bit stream." A "bit" or segment of the stream that is missing can be "corrected" by some fancy high speed calculations performed by the FEC system. And a bit that is corrupted (present but seemingly not the correct bit for that specific location in the data stream) can also be corrected. Missing or wrong bits, determined by the Forward Error Correction system in the receiver, are within the range of expected "errors." Most errors occur at random times in widely separated portions of the data stream and the FEC of the receiver is not stressed with identifying, and correcting, these random errors.

However, if there is a significant portion of the data stream that is missing or corrupted, the FEC cannot cope with the *quantity* of errors present. That is when - as we know from our satellite TV experience - the image on the screen first goes into "tiles" or "blocks" and then disappears totally (leaving behind the fabled "blue screen" or a receiver created message advising the reception is no longer possible).

DVB-T (digital television broadcasting using terrestrial delivery) has several technical forms. Two of these are widely enough employed to be approaching world-class standard.

COFDM is one format. 8-VSB is another. COFDM now has more than 600,000 terrestrial receivers functioning, virtually all in the UK. 8-VSB has something fewer than 10,000 receivers operating, virtually all in the USA.

Differences - COFDM and 8-VSB

In theory, COFDM and 8-VSB are capable of delivering the same digital television services. But digital is not automatically HDTV (high definition) and in the UK, COFDM has been specifically adapted to not provide HDTV. The British don't see any reason to adopt a higher definition ("35mm-movie-like") image system. COFDM is presently in use only to transmit SDTV (standard definition television).

Standard definition digital television (SDTV) has the same technical quality (on screen image) as PAL analogue 625 line television. Either 625 PAL or (625) SDTV digital can be configured in wide screen (16:9 aspect ratio - 16 units wide for 9 units high).

HDTV can be configured as 4:3 aspect ratio (4 units of width to 3 units of height, as you now have in your home), 16:9 or any number of other formats. "Wide screen" should not be confused with either digital or high definition. The aspect ratio of a transmission is set by the broadcaster based upon the aspect ratio of the original material being broadcast. Many originally-widescreen programs (such as theatre films adapted for television) reduce the TV image to 4:3 by using a technique known as "pan and scan" which projects the original wide screen image onto a theatre like screen and the TV camera literally swings left and right ("panning") selecting a segment of the image to be telecast. A pan and scan conversion of a widescreen movie essentially "edits" the film for television's 4:3 screen.

It is important to understand - pan and scan, 16:9 displays are not exclusive to either COFDM or 8-VSB. Wide screen displays are even available in analogue receivers - wide is not the same as high(er) definition.

Terrestrial Multi-path

Digital data streams are simply a sequence of data bits (instructions) arranged in chronological order. The first data to be processed appears before the later data on the screen. Therefore there is a "time sequence" to the data stream - first in, first out. If one particular segment or chunk of data is corrupted (by noise, interference, improper receiver processing), the forward error correction system attempts to calculate what that piece should have been. It does this by looking at the data immediately before and after the corrupted part, as well as those appearing in the image segments immediately above and below the corrupted part. There are only two choices - digital has only two states (on and off, yes or no). Even a wild guess has a 50% chance of being correct.

Forward error correction (FEC) has a capacity limit. At FEC 1/2, each bit of data is sent two times (1 bit sent two times = 1/2). At FEC 7/8, for each 7 bits of data there are 8 bits sent. FEC 1/2 is 200% redundant (1 bit sent twice = 200% transmission of the original data) while FEC 7/8 is 112.5% redundant.

When the number of errors exceeds the FEC ability to correct, reception simply stops. There is no in between state as with ghost riddled, snowy analogue (not good but not so bad as to be totally unusable).

Ghosts or multipath reception with DVB-T causes two or more identical data streams to be inside of the receiver at the same time. It happens they are more or less the same in content, *but not in time*. One arrives first, another arrives a few milliseconds later (third and fourth arrive still later). Inside the FEC circuit, the data streams collide. And the receiver is hopelessly lost, unable to decide (1) which is the original, (2) which is the best. Moreover, in most instances the two (or more) same-streams delayed in time from one another have differing errors. They may have begun at the transmitter as one data stream, but at the receiver the multiple transmission paths have created two (or more) now different (in error content) streams. The DVB-T receiver, like satellite DVB receivers, when confused by the content of the data stream simply shuts down. And the problem gets worse when the source of the reflection is moving.

Ghost corrupted data stream: Y Y Y Y N N Y ? Y N Y Y Y Y Y Y ? ? N N N Y Y Y Y Y N N N N ? Y Y Y Y N N N N ? Y Y Y Y Y
Y Y Y Y N N Y Y Y N Y Y ? ? ? Y N N N ? ? N Y Y Y ? ? N N N N N Y ? ? ? ? ? N N N N Y Y Y Y Y Y

Slightly delayed in time, a near duplicate data stream arrives at the receiver from a reflected signal path causing the receiver to become confused - which data is the correct stream? Can either stream be corrected???

COFDM around us

Australia has elected COFDM at top government level. New Zealand has a recommendation to use COFDM as well and during December a channel allocation scheme was created (1) to allow the digital TV.

COFDM in Australia will be totally unlike COFDM used in any other country. First, it is to be HDTV and SDTV *simultaneously*. Second, it will use a stereo audio technology borrowed from the American 8-VSB format called ACT-3.

COFDM in New Zealand is not fully defined although HDTV is not in the plans at this stage. It appears the New Zealand version of DVB-T will be identical to that employed in the UK.

COFDM and 8-VSB multipath

Before Australia selected COFDM for their "standard," extensive testing was done with both this and 8-VSB in Sydney. COFDM was selected for HDTV broadcasting over 8-VSB because of a number of test results:

1) COFDM tests were superior to 8-VSB when there was multi-path present. Multipath (ghosting) does not have to come from a stationary source - such as a building. A home located where there is vehicular traffic nearby will experience moving-multipath - reflections from cars, trucks and even airplanes. This is an especially tough type of multipath because when the reflection surface moves, the degree of multipath varies as a function of the speed of the vehicle and the direction of travel reference the static receiving and transmitting locations. This creates something known as "Doppler shift" which means the actual transmitting frequency of the reflected signal varies by up to several hundred hertz (per second).

Doppler shift multipath adds a new element to the confused FEC circuit - not only are there two (or more) separate signals appearing at the same time (one or more slightly delayed in time from the first), but the strength or amplitude of the Doppler reflected signal is varying at a high rate per second - because the reflection point is moving.

A similar effect is created when indoor (rabbit ear, set-top) aerials are used for DVB-T reception. Viewers are most apt to use an indoor antenna in a strong signal area (close to the transmitter). It is close to the transmitter that multipath reflections are most severe - simply because there is so much signal it bounces from virtually any solid surface. Indoor antennas are at best modified dipoles with almost no "directivity." An indoor aerial has a very difficult time "peaking" on a signal coming only from one direction (the TV transmitter) and is very susceptible to reflected signals bouncing off of nearby objects. It does not take a steel plate to create a reflector - even a wooden wall or door inside the home acts as a reflection surface. The precise placement of the set-top aerial can be seen even with analogue reception - stand by the TV set and select the channel which has the most critical set-top aerial tuning. After adjusting the rabbit ears for best looking picture, walk away from the set while looking at the screen. Even the retreating human body, moving away from the TV set, will be "seen" as undulations in the received image. With analogue reception, such multipath variations are annoying but not deadly. With digital, the effects are catastrophic.

2) COFDM was believed to be the equal of 8-VSB for fringe area (outside of primary coverage region) reception. Not all of the final testing is in on this factor yet - although Australia conducted more than a month of testing of COFDM versus 8-VSB, the most extensive testing on a side-by-side basis is now approaching its first birthday in Baltimore, Maryland (USA).

3) COFDM, unlike 8-VSB, can be repeated on the same channel. A fill-in station receiving on channel 8 can be rebroadcast on channel 8 with COFDM whereas with analogue (and 8-VSB) the input and output channels must be different - to prevent "feedback."

The Sinclair (Baltimore) tests have revealed the following:

1) In areas where analogue TV reception is "passable" (perhaps ghostly, not perfect) using indoor (set-top) antennas, 8-VSB fails completely. However, COFDM works in slightly more than half the locations where 8-VSB fails - but of importance, not 100%.

2) In locations where 8-VSB does work on a set-top aerial, humans walking through the room, cars driving by in the street cause reception to stop. COFDM, in the same situation, may "sputter" but seldom totally stops.

The failure of 8-VSB to work at locations where set-top aerials do work (although often with impaired pictures) for analogue is a major reason why 8-VSB is now being reconsidered as a suitable DVB-T format for the USA. More than 50% of the US television broadcasters have indicated they are in favour of changing the DVB-T standard in the USA - they would like to have the freedom to transmit either 8-VSB or COFDM, their choice. Present rules do not (contrary to a common misbelief) absolutely prohibit COFDM. But, the various industry groups have backed 8-VSB and not COFDM and as a result the only DVB-T receivers offered are 8-VSB.

There is more to the 8-VSB failure than mere inconvenience. TV is now installed in 98% of all homes in developed countries. Although we first think about TV as a "stationary" system, in fact it is the portability that has largely escaped recognition. Analogue TV works because it does not require "perfect" reception to display an image. Pocket-sized minisets to portables that move easily and without effort room to room make TV "coverage" universal.

What about digital reception that does not work with rabbit ear antennas? Many US telecasters believe the public service role - being the conscience and reflector of their respective communities - will suffer when people lose the ability to tune-in without special equipment.

"*When it is no longer convenient, no longer simply a matter of pushing the on button to tune us in, I believe we will have lost an important element in TV broadcasting*" notes the President of Sinclair Broadcasting, one of the major proponents of COFDM in North America.

Broadcasters losing coverage or homes reached is a self-interest matter. But not to the US Department of Defense (the Pentagon). They have come out requesting that the US (broadcast) regulatory agency (the FCC) allow COFDM in addition to 8-VSB. The Pentagon:

1/ Finding "room" in an already crowded TV spectrum for new channel space has been a major sub-set problem. Most of the new DVB-T channel space in the USA has been in the UHF band; virtually all of the Australian DVB-T channels are in band III (VHF). In New Zealand and the UK, all DVB-T is in the UHF (bands IV and V) region.

The Most Advanced Free To Air Digital Satellite Receiver

D7-MediaStar

- MCPC/SCPC 2-36 Msym
- Direct channel selection from channel list
- Channel Edit menu Delete, Skip, ON.
- Fast response when changing channels
- No channel over-write
- 200 Video 100 Audio channels
- Automatic search and download
- 22 kHz switch
- PID Menu
- NTSC/PAL Auto switching NO NTSC Glitch
- NTSC converted to PAL-60Hz Free Option
- Audio L, R, Stereo selectable via remote control
- RF Modulator PAL-G, VCR/TV Scarts, RCA Audio/Video, SVHS outputs.
- 90-265VAC-50-60Hz power supply
- Low threshold performance

MediaStar Communications International
24 Bosci Road
Ingleburn NSW 2565 Australia

E-mail opac@bigpond.com
Tel ++61 2 9618 5777
Fax ++61 2 9618 5077

"TV transmission is the primary method of reaching the citizenry in times of natural or national disaster with advice or emergency instructions. If 8-VSB works poorly to indoor set-top antennas, if citizens must have 30 foot masts with complicated aerials to receive these instructions, the benefits of TV as a medium of quick, all-encompasing national instruction is lost. The very people who need the information the most will be those in areas where the masts are laying on the ground and the antennas destroyed."

Is COFDM the answer?

To this point the primary evidence suggests strongly that 8-VSB, which is not the planned format for the Pacific or Asia at this stage, is decidedly inferior to COFDM. It would be dangerous to assume from this that COFDM is, therefore, more akin to analogue. *It is not.*

The reality is simply this. DVB-T comes with a built-in limitation. Analogue has always had "head room," that range of reception between blemish free and totally unwatchable where various tricks with (larger) antennas, masthead amplifiers and more sensitive receivers are employed. Or, alternately, viewers accept less than blemish free reception and grow accustomed to watching pictures marred with interference, ghosts and snow. For all intents and purposes, there is no such head room with digital. Yes, larger antennas and perhaps masthead amplifiers will *slightly* enlarge the coverage region but people living behind hills, blocked from a "clean shot" to the TV transmitter, prevented for aesthetic or other reasons from installing a sensitive rooftop aerial will simply find digital unworkable. Whether it be COFDM or 8-VSB.

Most adversely affected will be those who presently view their analogue reception using indoor aerials. There is a dramatic difference in having an extra ghost head on the actor on screen when you get up from the couch to walk to the kitchen - that is infinitely better than having the reception totally freeze for as long as it takes to leave the living room. "*Quit moving around - I'm trying to watch television!*" may become a password for digital reception in many homes.

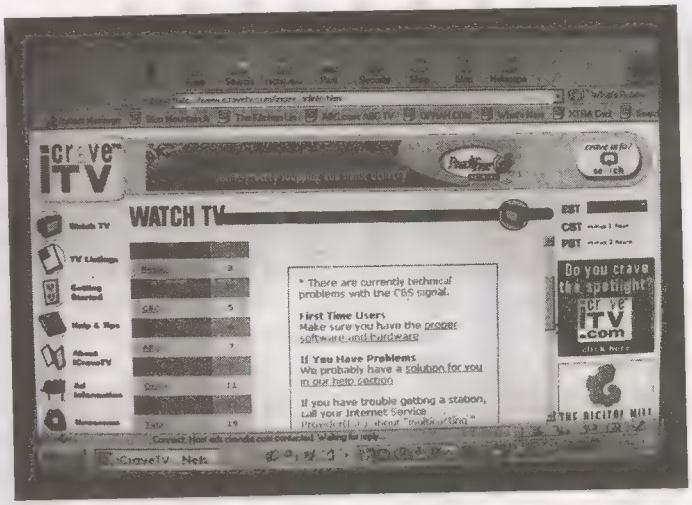
Meanwhile - the replacement for television

Broadcast television will be 50 years old in Australia in 2006; 2010 in New Zealand. In the UK, the 50th year was 1986 and in the USA, 1991. The TV we have today is an improved but hardly revolutionary adaptation of 50 years prior.

For most reading this, television has been a routine part of our lives for virtually all of our lives. Almost nothing lasts a lifetime, especially in the technology field.

For more than 50 years, the premise of television has been through-the-air-broadcasting supported by advertising or public purse or a combination of both. The delivery system from day one has been the "public airwaves" and access with limited exception has been universal provided the viewer purchases his or her own receiving equipment.

As most are aware, it is now possible to deliver a form of television through Internet - the wire line telephone connection which allows a home PC equipped with a modem to access "Web sites" half a world distant. No, it is not yet "broadcast quality" television, at least not through a standard telephone connection. But - *and this is important* - it comes closer and



Pioneer Internet TV provider, icraveTV.com, has 17 different TV stations / networks available 24 hours daily from Toronto, Ontario base camp.

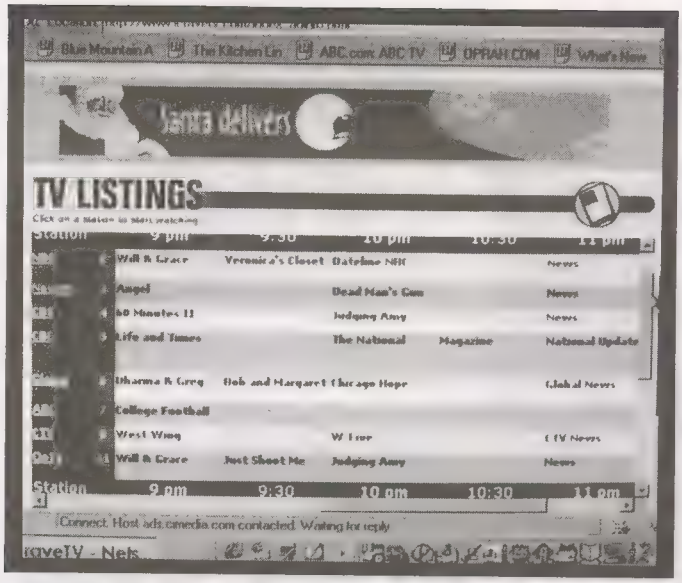
closer to what we call broadcast television each month. Those who believe that "digital compression technology" will improve over time to allow "full motion, broadcast quality television through telephone lines" are most likely correct with their forecasts.

The limiting factor is the transport bandwidth of the interconnected telephone services that link a PC with a distant Web site. The goal using current digital compression technology is in the region of 400 to 700 kbps (kilobits per second) - if you could create a link that maintained a transmission "speed" of at least 400 kbps from your PC to the Web site, you'd have full motion, broadcast TV *right now*.

As compression technology matures, the 400 kbps requirement will become smaller and smaller, perhaps even approaching the 56 kbps technology of today's current home PC modems (the modem is the computer portion connecting the PC to the telephone service). There are other ways to get 400 kbps service. IHUG satellite delivered technology, for example, claims a 400 kbps downlink speed. Cable TV subscribers with 10 Mbps cable modem set-top boxes are obviously well past the 400 kbps benchmark.

"icraveTV.com" is a pioneer Internet TV broadcaster; 17 TV channels covering the full range of US and Canadian network services plus non-network stations from a facility in Toronto. In a 56 kbps modem, about the best you can expect is 3 frames per second - a bit like watching a VHS video in the automatic frame advance mode. The audio, on the other hand, typically is real time.

There are two inhibiting factors presently preventing Internet TV from blowing terrestrial TV off the landscape. Number one is transmission speed - bandwidth in the TV business. Even if you happen to have higher speed Internet connection capability (such as ISDN 128 kbps), chances are you won't do much better than someone equipped with a 56 kbps modem. Why? Two reasons - one is that while 128 is 229% faster than 56, this is still but 32% of the required 400 minimum. Second reason - the *entire link* from icraveTV.com to you must be capable of the minimum transmission speed (bandwidth). Any portion of the link, whether it is in Toronto or down your street close to home, must be 400 kbps capable. And at all links in between the two points.



icraveTV.com includes complete schedule for all channels, after "registering" (use 604 for area code number required), and loading RealVideo (G2) software to process service (directions for free download, update on site), you click on channel you wish to view. One caution - icraveTV is one day "behind" Pacific/Asia and currently 17 hours from New Zealand, 15 from Sydney.

---

icraveTV.com immediately drew very angry antagonists when going "on the air" late in November. The US networks said their copyright was being violated; the American NFL professional football league had a similar response and threats of lawsuits flew in a dozen directions.

This is the first attempt to distribute a wide selection of television programming using Internet. And these are early days, not simply because the technology to support real speed, broadcast quality television is still developing. There are (no surprise here) "legal questions" concerning the use of the broadcast television channel material on the icraveTV.com site. Note that all of the channels are "broadcast" (FTA, through the air) services - no pay-TV. We'll leave a discussion of the copyright questions until a later time - but note that in the process of converting the FTA off-air channels to their Web site, icraveTV does technically alter the broadcaster's content by surrounding it with new advertising which supports their Web site.

Any TV station - anywhere, via Internet

Placing a TV broadcast service on Internet is not a new concept; several dozen TV services (including TV One in New Zealand) have done so in the past. So too have created-for-Internet video services been supplied. The process is called "streaming video" which translates to - in the absence of at least 400 kbps transmission speed (bandwidth) between the originator and the viewer - the video "streams" (flows) in an erratic manner. The start and stop ("slide show " format) is an artefact of the less than adequate bandwidth. With each improvement in compression technology, and improved software to process the video (such as the RealVideo G2 software), the slide show "speeds up."

Because the entire circuit from originator to your PC has to be capable of at least 400 kbps transmission speed, logging onto an icraveTV type of service with flawless broadcast video has to start at the viewer's location and work backwards. Step one - have a modem or link connection good for at least that speed. (2) There are two possible choices: (1) Connect to Internet through a higher speed satellite connection (IHUG, Telstra Big Pond) or (2) if you have access to a cable TV system offering a cable-modem box connection, use it. An example of what you might find is shown below (2).

The next step is to find a way to route your icraveTV (or similar) connection through as few satellite links, or as much fibre optic cable, as possible between you and the server site. The further you are located from a major centre where gigabits of international Internet capacity are available, the less likely you are to have a high speed transmission. The path from Toronto to the Pacific is long, and if at any point along the way the transmission speed is throttled down because of a lack of network transmission bandwidth capacity, the system will drop back to a slide show presentation, even if you have 400 kbps capability. This is the age old story of a chain only being as good as the weakest link.

Satellite link operators routinely "manage" their throughput (bandwidth capacity) to accommodate the maximum number of customers simultaneously. If you are "hogging" 400 kbps of icraveTV video to your home, the same raw network capacity could be supplying 7 others simultaneously with each using 56 kbps. Between that 400 kbps ideal and 56 kbps is a range of speeds which the network can under software direction deliver to you (see 2 below). A satellite transponder has the capacity to deliver around 56 megabytes per second (mbps) - that's 1,000 users with 56 kbps assigned to each. Fibre optic (undersea and across land) cable networks are no different. But times are changing, rapidly.

We don't hear much about the expansion of fibre optic cable networks but in fact they are growing even faster in capacity than satellites. Internet2 is a university supported fibre optic network now functional in North America offering connect speeds of up to 1.36 mbps (24 times faster than 56 kbps). CA*Net3 is a Canadian Government fibre optic initiative offering transmission speeds 60 times faster than Internet2! One of the early sites on CA*Net3 is the Canadian Film Board which offers any of 700 library movies on request from DVD.

It was only in 1956 the first transatlantic telephone cable went into operation; 100 repeater stations under the sea, 1600 tubes (that had to be replaced periodically), and a capacity of 51 telephone calls. In 2000, we have dozens of transatlantic cables and two of these (with 2.5 terabit capacity) can carry the equivalent of 500,000 TV programme channels each! The Pacific?

New 80 Gigabit fibresphere (as they are called in the trade) links are going in all around us; North America to Japan, a "loop" that comes south towards Australia and eventually New Zealand. Commerce and trade, even consumer entertainment, will increasingly move on fibresphere cables. Countries with a connection will be "modern" and those that do not will become a new category of technology isolated communities.

2/ Ron Theaker, Manager for iHUG Digital TV (E-mail ron@ihug.co.nz) in Auckland, NZ reports, "I tried it with no real problems (after telling it I was in Canada) and watched several streams at 80 kbps and 116 kbps. Not bad really but not TV quality. And yes, you do need RealPlayer 3 with plug ins." Also, see p. 1 here further comments.

Even an 80 gbps undersea cable is a giant when compared to the relatively limited 56 mbps capacity of a satellite transponder. One 80 gbps cable is the equivalent of 1,428 satellite transponders, one 2.5 tbps fibresphere is - well, it is a very big number (remember the 500,000 real time broadcast TV channel capacity - with 12 TV programme channels per transponder, it would take 41,667 satellite transponders to do the work of one 2.5 tbps fibresphere cable!).

Meanwhile - back at DVB-T

If this suggests a backdoor entry from the fibre optic investors, seriously challenging satellite in the future, you are partially right. Where satellite now links Los Angeles to Sydney (a route where fibresphere will shortly be available), it will be far cheaper and far less trouble for programmers such as Foxtel to bring in their stateside originated feeds on cable. Those ABC/CBS/Fox/NBC feeds now routinely sent to Sydney will go to cable. But for a decade or more into the new millennium, fibre will not reach every place where TV links need to go. Fiji, PNG, and *your house* - for example.

Telephone companies now routinely carry fibre of some capacity to neighbourhood "substations". Where cable TV exists, it is technically possible to "jump" out of the fibre onto coax to make the last kilometre run to individual homes (where cable modems can be used to gain 10 mbps delivery speeds to your home PC). Where it does not exist, telephone firms such as Bell Atlantic and AT&T are experimenting with short-haul 28 and 40 GHz microwave links to cover "the last kilometre." And more recently, moderately high power infrared "beams" that are modulated with telephone and data signals. All of this is necessary because old copper wire twisted pair drop lines running from the substation to your home (and PC) are bandwidth limited; so badly so that the telcos must either replace them with fibre (or coax), or go over the top with microwave radio or infrared.

This is of course the "satellite advantage." A C or Ku band satellite signal is the ultimate method of "going over the top" and bypassing the bandwidth restricted copper phone lines. But what about DVB-T?

There is no evidence at this time that suggests the transition from analogue TV to digital TV through terrestrial transmitters is going to be easy. In fact, even using COFDM there are serious problems which are very worrying.

It comes down to this. While most engineers recognised that forward error correction established a new "threshold of reception" for DVB-T, very few understood what might happen when VHF and UHF signals transmitted through the air took more than one (direct) path from the (TV) transmitter to the receiver. The United States, in adopting the 8-VSB standard for DVB-T, committed a serious error when they neglected to properly test 8-VSB in metropolitan regions with indoor or simplistic outdoor aerials. The COFDM camp made and equally serious mistake by not properly measuring the degradation effects where combustion engines and electrical equipment operates (such as elevators, water pumps, other devices that create sparking interference in the VHF and UHF range). COFDM also works on average around 50% of the time with an indoor antenna - it, like 8-VSB, virtually demands an outdoor antenna. Here's another eye opener - when two or more different DVB-T transmitters share a common antenna transmitting site, even those using an outdoor rooftop antenna have discovered the antenna must be reoriented 20-25 degrees when changing channels. And if the 7, 9 and 10 (Australian example) networks operate from different DVB-T transmission sites, based upon present experience each home will either require a separate antenna for each station, or, a motor-driven (antenna rotor) to repoint the outdoor aerial each time a station change takes place. That will certainly slow down channel surfing!

"*They will fix these problems with better receivers*" is a hopeful response. The first generation 8-VSB receivers were blamed for the reception problems in the USA. Then along came generation two, and during December an entirely new family of "hot off the press" digital decoders from the likes of Motorola - promising to fix the problems. In an extensive report posted on Internet late in December, a frank admission from Motorola that even their latest decoder chips failed to correct the problems.

Meanwhile, politicians are pretending there are no technical problems with DVB-T, proudly patting themselves on the back for being the instigators of a "digital TV transition program" for their respective countries. Australia now says it will activate DVB-T in 2001 in major cities, and they expect existing analogue TV to turn off (shut down completely) by 2008.

DVB-T could well end up being the millstone around the neck of terrestrial television that kills the industry. Not dead, you understand - but so severely wounds its progress that while DVB-T flounders with a myriad of technical and pricing problems, satellite TV and yes even Internet become serious competitors.

Political pressures have created "rules" for DVB-T which border on the heretical. In Australia, for example, terrestrial broadcasters have no option - they must do DVB-T by a certain date. Then they must transmit not only COFDM HDTV but COFDM SDTV simultaneously, to please the politicians who finally realised that not every TV viewer was going to be able to afford a HDTV receiver.

Remember that SDTV is PAL 625 line quality - no improvement in image definition (and depending upon how the HDTV and SDTV is partitioned inside of the 7 MHz channel, it could easily be lower definition than analogue). But SDTV will have ACT-3 stereo? *Perhaps*. Provided the original material was available in stereo (most is not - less than 10%) and provided the ACT-3 can be crammed into the 7 MHz bandwidth along with HDTV.

Cannot viewers opt for a digital set-top converter for a fraction of the cost of SDTV or HDTV receivers? Yes, but. But - the set-top digital box processes the digital signal and then like the satellite IRD hands it back to the analogue TV set as an analogue signal. There are *no benefits* to DVB-T that ends up being watched on an old analogue TV set. And if the viewing location has less than perfect, ghost-free, interference-free analogue when the digital set-top box is installed - well, imperfect analogue is heaps better than a blue screen or set-top advisory offering excuses for why there is no TV reception.

Old Chinese proverb:

"May you live in interesting times."

New Cooper proverb:

"We all know who invented the telephone, the geostationary satellite system, the electric light. You will notice nobody is currently taking credit for inventing DVB-T. Perhaps the creator is ashamed of the way it works?"

Gone fishin'!

After 14 years of providing and installing dishes from 1.8m to 13m throughout the Pacific -

Bryon Evans' Pacific Antennas Limited is on the market.

A total operating established business with an enviable track record. Complete - all tools, a sizeable inventory of (Andrew, Patriot, R.S.I., Scientific Atlanta and other) antennas up to 6.5M in size, trailer mounted antennas equipped for demo or downlinking contract fulfilment, digital and analogue receivers, LNBs, feeds - first class (American) Chevy work vehicle, and work in process (real estate optional with on-site pads for dishes up to 13m in size!).

INCLUDES: Dishes up to 6.5 metres in size on operating rental agreements at well established, 4-A rated, client facilities. Ongoing commercial business with clients such as AAPT, BT, Prime TV, Sky NZ and many more. Spectrum analysers, full tool and field construction equipment - everything we have needed to go virtually anyplace in the Pacific to install antennas up to 13m in size.

FLEXIBLE purchase arrangements. Your option one: Purchase business and inventory, move to your own location. Your option two: Purchase business and Whangaparaoa (north of Auckland) property (with dishes, pads for dishes to 13m in place, microwave linking permits to Auckland in hand). Your option three (at seller's discretion): Purchase segments less property, company (Chevy) work vehicle.

What we do: Pacific Antennas Limited is the leading satellite dish rebuilder in the Pacific. We purchase, refurbish, resell and install as required professional grade transmit and receive satellite antenna systems featuring some of the most creative mounting and tracking systems on the planet. This is a hands-on business with a dedicated professional staff available for new management and enthusiasm.

Pacific Antennas

Limited

Bryon G.G. Evans, PO Box 265, Whangaparaoa, NZ

tel/fax +64-9-424-0841 • Mobile 025-789-160

email ablefox@hug.co.nz

Pricing: All up - NZ$330,000 *

Serious enquiries only - the present owner does not have time for dish thumpers who get in the way of his fishing!

* - includes rental contracts, all equipment

Digital cell fones creating TI?

TERRESTRIAL INTERFERENCE is MAJOR NEW PROBLEM in AUSTRALIA

Something new, for the Pacific, is creating interference for C-band satellite reception. Melbourne and the region around it has been especially hard hit, Adelaide is another area of significant "TI." TI stands for Terrestrial Interference - signals originating at earth located transmitters, getting into C-band satellite systems and creating so much interference that satellite consumers are asking their installers to "*fix it or take it out.*"

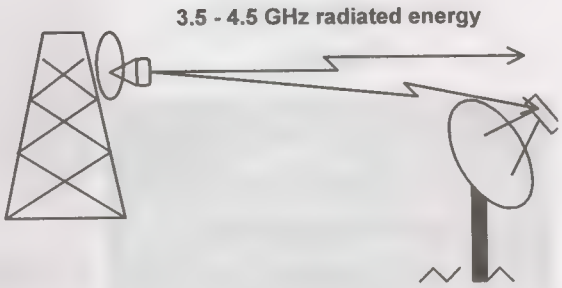
The interference shows up as intermittent black outs of reception - as close together as two second bursts, as far apart as several minutes. The interference "hits," the reception stops and the screen goes black or blue (typically on the European Bouquet from AsiaSat 2 but certainly not limited to this service) and then pops back as if nothing torrid had occurred.

Welcome to the world of TI.

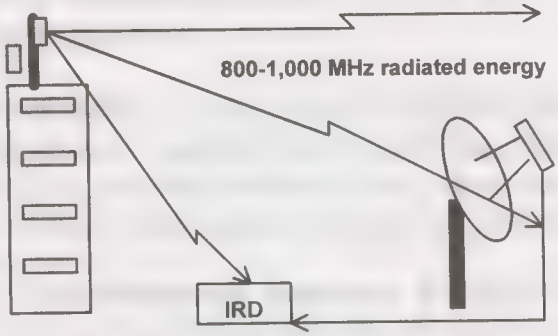
TI stems from close proximity transmitters which radiate signals that appear inside of the satellite processing electronics. In North America, the 3.7 to 4.2 GHz (C-band) satellite service frequency assignment is actually "shared" between the satellite to earth and point to point microwave links built by AT&T starting in 1947. In this situation, signals radiated by the microwave towers are actually in the same (C) frequency band as the satellite signals. And if the satellite receive site is within a few miles of the microwave tower, and in line with its highly directional horn (parabolic type) antenna, point to point signals are many thousands of times stronger than the weak satellite signals. In the worst situations, C-band TI wipes out a complete satellite band or at the very least one polarisation of a satellite (see SPACE Pacific Report TV show 9901 which covers this in some detail).

The much stronger TI source signals simply overload the LNB(F) - they are so much stronger than the satellite signals that they "swamp" the amplifier circuits with signal, essentially turning off the amplifiers. No amplification, no C-band to L-band conversion of the satellite signals. C-band terrestrial microwave is not limited to North America, but it is much less common elsewhere in the world. We can be pleased AT&T never got into "exporting" this particular technology.

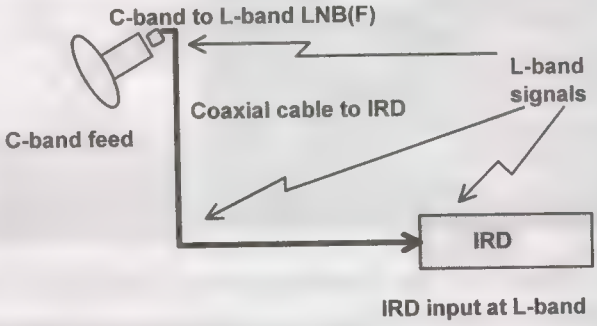
The recently arrived Australian problem stems from another source. Remember our LNB is a two part device - it amplifies the C-band satellite frequency range, then with a local oscillator (LO) down converts (frequency shifts) the C-band signals to an "IF" (intermediate frequency) range; typically 950 MHz to 1,450 MHz (.950 to 1.45 GHz). LNBs do this to make it possible for low-cost, smaller coaxial cable to transport the microwave frequency band C-band (or Ku band) signals from the antenna to the satellite receiver (IRD) with less loss. Common RG-6 family cable has losses approaching dB per foot of cable at 4 GHz, but only a fraction of this at 1.450 GHz. Before there were LNBs with L-band IFs, all satellite installations used large (7/8s inch was common) coaxial cables to link the LNA (low noise amplifier) located at the feed of the dish to the satellite receiver (indoors). You can be glad technology changed this way of doing things - 7/8s cable was not only expensive, but "semi-rigid" and virtually impossible to handle in confined areas. And the connectors went on with blow torches and pipe wrenches! So in the modern satellite world, we have two frequency bands which



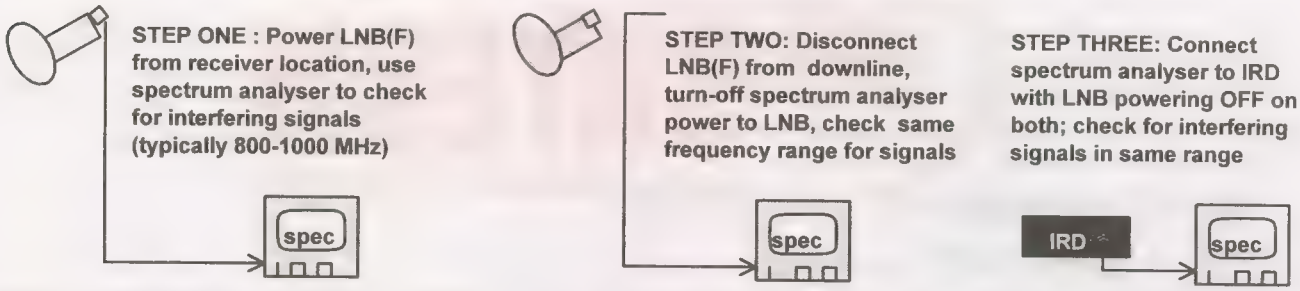
Traditional TI - 3.5 - 4.5 GHz terrestrial signal "bleeds" into C-band dish feed from nearby point to point microwave link in same frequency band.



Cell phone TI is at L-band (in 950 - 1,450 MHz) region, goes directly into system after output of LNB/LNBF within L-band region.



L-band TI signals are most likely to leak into system after LNB(F) through coaxial cable, cable fittings, or even directly into IRD input circuits.



are susceptible to "TI"; the original satellite downlink frequency band (C or Ku) and the L-band IF range. Most of the Australian interference reported appears to be the result of L-band ingress at this stage.

What happens to the system

Satellite signals required to drive the receiver to proper operation are - by terrestrial standards - very weak. A LNB with 60+ dB of gain raises those signal levels by approximately 1,000 times. What results arriving at the receiver is still, by terrestrial standards, very weak. A 900 MHz cell phone transmitter is stronger to the tiny whip antenna at a distance of 2 km than the satellite signals coming out of a 3m dish in a 35 dBw footprint by a factor of 100 times. In other words, when a very strong cell phone (base) transmitter operates in close proximity to a C-band dish trying to create enough signal to make AsiaSat 2 play in eastern Australia, the relatively wide band amplification electronics of the satellite receiving system does not have a chance. Yes - the L-band electronics is supposed to be functional only from 950 to 1450 MHz but in fact the gain of the IF system (in both the LNB and the IRD itself) at 900 MHz or even 850 MHz is still in the range of 35 to 40 dB.

The satellite system simply overloads - collapses because of the presence of the very strong cell phone signal. When the amplifiers in the C-band system collapse, the screen goes dark (or blue) and everything stops, briefly.

First - determine the frequency of the interference. There are three steps to do this, and in the process you will also learn where the interference is entering the system. In the diagrams above, we see the interference entering the system through the LNB(F). By disconnecting the IRD and connecting a suitable spectrum analyser at the indoor end of the downline, you can repower the LNB and watch for signs of interfering signals.

Here are some clues:

1) If the C-band TV signals on are constant on the analyser while the IRD is collapsing from the interference, the problem is happening *inside* of the IRD. You can determine this by installing a 2-way splitter at the IRD and monitoring both the analyser and the TV picture simultaneously.

2) If the signals on the analyser rise up on the screen and then collapse simultaneous to the picture quitting on the TV receiver, the problem is most probably at C-band or near C-band - perhaps a new airport radar. If the time sequence between "hits" is regular (every 10 seconds for example), you can almost imagine a radar antenna sweeping around a 360 degree circle and pointing at your dish (and overloading the LNB with radar emissions) once every ten seconds. A C-band region airport radar operating anyplace above 1.5 GHz up to 6 GHz can destroy a LNB's operation at distances as great as 10 miles.

3) If the interfering signal shows up as a spike (strong signal) in the low IF end of the IRD (from 950 MHz down to perhaps 800 MHz), the problem is most likely from a cell phone transmitter site. They operate +/- 900 MHz, and the timing sequence (once every X or XX seconds) is the "polling transmitter" asking all phones in range to identify themselves.

In step two above, we disconnect the RG6 downline from the LNB, turn off the LNB powering at the spectrum analyser, and watch to see if the signal still shows up. If it does, the coaxial downline is your "antenna" - the solution is better shielded coaxial cable, bury the cable underground, check the quality and fit of the F fitting at the LNB end. If the interference only happens when the downline is connected to the LNB(f), the problem cell phone interference is being picked up (and probably amplified) inside of the LNB. First try a totally different brand and model, then try a temporary shield of aluminium foil tightly wrapped around the LNB housing and F connector at the rear (watch out for plastic cased LNBs!).

In step three above, the IRD is connected to the spectrum analyser. This measures whether the interfering energy is getting directly into the IRD. If the IRD has an input and an output, turn off LNB powering on the IRD, terminate the input side with a 75 ohm resistor and connect the output (thru-put) F connector on the IRD to the spectrum analyser (no power of

Field Report

"With the increase in mobile telephone towers everywhere and also new microwave links, I am having problems with two of my customers. One has been in for two weeks, another 14 months and both were interference free until this began. One customer cannot watch As2 while the other will perhaps be a rip out because they have interference on all satellites and all channels! It does not matter where you point the dish, and I have tried 3 different LNBs and 3 different digital receivers. Also changed the RG6 from tri-shield to quad shield with very little difference. Only one street away, another installer has the same problem and he may have to rip it out as well. The interference is a split second freeze of picture and a short loss of sound, occurs 24 hours a day and at varying intervals between 2 and 40 seconds. No visible bad signals on the spectrum, and typical C/Ns of 11 to 13 dB or better."

Tony Drexel, Free To Air Satellite, South Australia

> p. 18

SATECH

Satellite Communication Technology Pty. Ltd.

HERE IT IS - the **ONE** IRD you need for your FTA customers

as reported in SatFACTS December 1999

There are no negatives about the SRT 4600 that we would wring out in a month of testing. No glitches, no "turn it off for a reset," no annoying software routine miscues. Equally at home on C or Ku, any format video, PowerVu or "real" DVB as long as the service is FTA.

The STRONG SRT 4600 - the **ONE** IRD

that is consumer and installer friendly!

Sole distributor for Phoenix Worldwide

SATECH

Satellite Communication Technology Pty. Ltd.

Head Office: 6/477 Warrigal Road Moorabbin East Victoria Australia 3189 Ph: 61 3 9553 3399 Fax: 61 3 9553 3393

SATECH

Satellite Communication Technology Pty. Ltd.

SATECH Distributors for the full range of CALAMP

- CALAMP C band 25k voltage switching LNBF
- CALAMP KU band 1db prime focus voltage switching LNBF
- CALAMP KU band 1 db off-set voltage switching LNBF
- CALAMP C band digi-ready phase locked loop 25k LNB
- CALAMP C band mini-mag 17k LNB
- CALAMP C band mini-mag digi extended 20k LNB
- CALAMP KU band 0.8 db LNB
- CALAMP KU band 1db high stability LNB
- CALAMP C band extended professional II low phase 20k
- CALAMP MMDS integrated antenna

also available cyclone 2.3m mesh dish

easy to install | reilable | cost effective

CABLES

Times Fibre & Comscope

RG 6 dual $99

huge range of RG6 & RG11

- duel
- quad
- flooded
- messengered

also 5 core tracking system cable
(available by reel or per meter)

TimeSaver 1

CHECK OUT OUR WEB PAGE ON

www.satech.com.au or email to us at satellite@satech.com.au

One Stop Shop

- *receivers*
- *dishes*
- *cables*
- *fly leads*
- *wallplates*
- *feedhorns*
- *Lnbs*
- *tools*
- *tape*
- *poles*
- *decktite*

SATECH Distributors for the full range of PARACLIPSE

Ring us for the lastest products from Strong Technologies
- Dishs 65 cm, 90 cm and 2 - 3 m
- LNB's
- Digital Receiver

DISHES

SATECH your no.1 paraclipse distributor for the complete paraclipse range

Paraclipse Dishes
- exceptional strength and wind resistance
- accurate reception

when quality counts

All products available through the following SATECH distributors:
-Satech (Victoria) Tel: (03) 9553 3399
-South Satellite (South Australia) Tel: (08) 8377 0955
-Network Satellite Services (NSW) Tel: (02) 9687 9903
- Norsat (Western Australia) Tel: (08) 9451 8300
-Mathews Electronic Service Services (New Zealand) Tel: (09) 634 5130, outside Auckland 0800-777 376

TI - continued from p. 15

course on the LNB input either). And look for signs of interfering energy in the 800-950 MHz region.

If the IRD is the "antenna" picking up the interfering energy directly, the solution is to wrap it carefully in copper or galvanised (not plastic) window screening as a test to see if by shielding the IRD the interference is eliminated or reduced.

Interference getting in through the LNB

LNB(f)s are relatively broad band - their "gain product" extends well below 2 GHz in most cases, up to 5 GHz as well. A signal, to "overload" (swamp with too much signal), does not have to fall inside of the 3.7 (3.4) to 4.2 GHz range. All LNBs have a maximum rated output - this is the arithmetic sum of all of the input signals applied times the gain of the device at the operating frequency of the signal. A 1 microvolt signal at the input at 4 GHz becomes 1,000 microvolts at the end of the amplifier chain with 60 dB of gain. Or, a 1,000 microvolt signal at 2 or 5 GHz becomes 10,000 microvolts after 20 dB of gain. An LNB can easily exhibit 20 dB of gain at either 2 or 5 GHz and in fact, an LNB rated to handle 1,000 microvolts maximum simply "folds up and quits" when a 1,000 microvolt signal grows to 10,000 microvolts after LNB amplification.

It is possible to install a "filter" device (tuned to trap out or reduce the signal level of the interfering carrier) between the C-band feed and the LNB throat - but there are penalties because the C-band signal is reduced in the process (turning a 2.4m dish into a 1.6m dish or worse). If the LNB is found to be the ingress point (where the interference is getting into the system), the best solution typically is to look for some way to shield the dish/LNB feed from the direct path of the terrestrial microwave signal(s). Getting it behind a building, erecting a fine mesh screen to block the interference from getting to the dish is one approach.

If the TI is getting into the system between the LNB(f) output and the input to the IRD (identified by disconnecting the downline from the LNB and still finding interference present), the downline is an "antenna." Use a better shielded downline - quad shielded RG6, even dual-quad shielded cable. And get it below ground (out of the interference field) as quickly as possible at the dish and keep it below ground until you approach the indoor IRD. Microwaves don't travel through earth very effectively. An external filter, installed indoors just ahead of the IRD, will also fix this situation most of the time (**1**).

If the TI is getting into the system at the IRD proper, indicated by the interference being present when you connect the IRD alone to the spectrum analyser inside the home, the IRD is playing "antenna." Most customers won't accept an IRD wrapped in a blanket of copper screening but that is how you start with a fix - the screening provides shielding that the IRD case should have done.

Some tips

Ku band systems that utilise the same 950 - 1450 MHz IFs can be a quick test system. Even a small dish with appropriate Ku-band LNB can be set up along side the C-band system and a monitor attached to see if the interference hits both C and Ku reception systems at the same time. If it does - this means the interference is getting in through the IF (L-band) frequency range which is common to the side by side C and Ku band systems. That eliminates wondering whether the C-band LNB is the culprit. The Ku band LNB(f) is so far removed in frequency from the 4 GHz C-band range that any common interference almost has to be at their common IF.

The timing between the interference "hits" can be a valuable clue. If you suspect airport radar, note how long the hits are apart, call the nearby airport control tower and ask if their radar sweep rate (complete circle of rotation) is "approximately X-XX seconds" at this time. If you suspect it is cell phone, note the time sequencing and contact their technical transmitter staff to ask if "X second repetition rates" means anything to them.

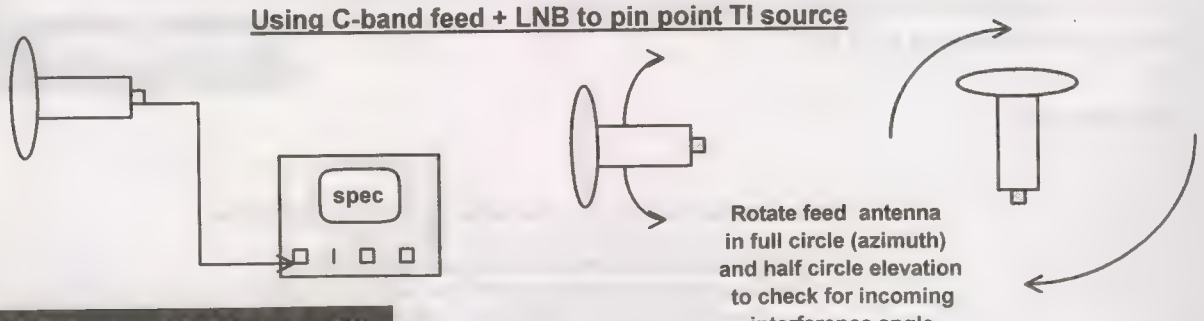
Interference that only occurs at certain times of the day (such as during business hours) could be a point to point terrestrial microwave link that gets "busy" only during office hours on weekdays. Any variation in timing is a clue - finding what it is a clue to - is the challenge!

Terrestrial 3.7 to 4.2 GHz microwave carrying video does exist in Australia - at least two readers in the past year have reported intercepting point to point links carrying commercial network and ABC feeds. However, such links should not exhibit a "rep rate" as described by Tony Drexel (p. 15, here) - a unique characteristics of radar and some forms of cell telephone sites. One reader reported perfect satellite-like reception on a set of terrestrial video (+ audio) feeds he found interfering with reception at his location.

Filters are a partial answer only (see **1**, below). If the LNB is getting zapped by a powerful nearby transmitter, the best solution will be shielding of the antenna and/or the feed of the antenna. Remember - if the dish points NW, the feed points SE back through the dish. No, the dish surface (whether solid or mesh) will not act as a total shield for terrestrial signals coming to the dish from the SE. If the system is only bothered by interference when pointing at one or two satellites, the odds are shielding (a cage) built around the feed structure will solve the problem. If the interference is coming over the top of or along an edge of the dish, shielding attached to the dish as an appendage will often help, destroying the microwave path to your feed. When you solve a TI problem, send us the details to pass on to others here!

1/ Filter source: David Dann, Communications & Energy Corp., tel ++1-315-452-0709, fax ++1-315-452-0732.

Using C-band feed + LNB to pin point TI source



a technical and marketing advisory

memo

to the membership from your industry trade association

SPACE Pacific
Satellite
Programme
Access
Committ**E**e

A trade association for users, designers, installers, sellers of private satellite-direct systems in the Pacific Ocean & Asia Regions

TPG - getting it right

Those who check into the SatFACTS Web site (http://www.satfacts.kwikopy.co.nz) are aware that recent observations concerning the new TPG free to air satellite service rollout have been less than laudatory. In particular, their approach to locating qualified dish system installers for their PAS-8 (12.725, SR25.728, FEC 7/8) service seems to be "*anyone who has ever installed a terrestrial television antenna is qualified.*" Further, the only special tools they believe you will need is a "crimping tool" for F fittings. They even discourage use of any kind of signal metering equipment, apparently oblivious to the fact that a mis-aligned dish is not peaked, only working under the clear sky conditions which existed at the time of the installation.

The SatFACTS Web site observations have drawn some interesting comments which we share with you.

"*It appears to me* TPG is on a run to boost their subscriber count for basic Internet service, preparatory to an ambitious stock float. We all know from experience that stock floats are tied to number of subscribers and a recent ramp-up of new subscribers always looks good in a stock prospectus. Putting new Internet subscribers on line in exchange for granting them access to a 'free' satellite TV service is actually a pretty inexpensive promotion for TPG."

Another observer pens:

"*Telstra's Big Pond* has the dubious distinction of having - by far - the largest churn rate in the industry. They are steadily losing market share. Ozemail (1) is at the same time growing very rapidly, and are poised to introduce satellite delivery of Internet throughout Australia. TPG Internet have watched all of this very carefully, and I know from my professional contacts there they are sound technical people, an aggressive and successful Internet provider, and skilled computer hardware systems integrator. They have the mix of costs right and are a successful company in every regard.

"(*If there is a weak spot*), it is their PR department. As with most Internet businesses, it is staffed by eager younger computer / advertising guys and gals who don't generally understand the technical niceties of getting the facts right before going to print. It is the PR department which has created the message to would be installers that 'untrained monkeys make successful satellite installers.' We all know better, and they will quickly learn this was not the right approach either.

"*They are planning to use* one version of decoder box for the FTA 'pay-TV' and another - after April - for the Internet download connection they will provide via their PAS-8 footprint. The separate box is much easier to integrate into a working system, rather than the Telemann card in a slot approach of IHUG which has proven at best to be a temperamental device.

"*I also understand* that when the satellite Internet download comes on line, TPG will offer a complete home PC system with the satellite link, as an option. By using separate boxes for each function, adding CA services is far easier. After the casual viewer gets used to 8 reasonable value services for virtually no cost, adding optional CA is the next step. If I were at Austar or Foxtel, I would be very concerned about how people might respond to 8 FTA satellite channels as a part of a $19.95 monthly charge that includes essentially unlimited Internet as well, against the $44 to $85 per month now charged for more TV channels. If you have a sport, movie, news, family viewing mix FTA with your Internet, it is a quantum leap to paying on average more than $50 a month for a slew of additional channels which on close inspection most people never watch anyhow.

MEMBERSHIP IN SPACE

Membership in SPACE Pacific is open to any individual or firm involved in the "satellite-direct" world in the Pacific and Asia regions. There are four levels of membership covering "Individuals," the "Installer/Dealer," the "Cable/SMATV Operator," and the "Importer/Distributor/Programmer." All levels receive periodic programme and equipment access updates from SPACE, significant discounts on goods and services from many member firms, and major discounts while attending the annual SPRCS (industry trade show) each year. Members also participate in policy creation forums, have correspondence training courses available and their support makes possible the TV show SPACE Pacific Report. To find out more, contact (fax) 64-9-406-1083 or use information request card, page 34, this issue of SatFACTS. Page space within SatFACTS is donated each month to the trade association without cost by the publisher.

"TPG's adventure into free pay-TV is a very cheap carrot to entice their existing (and prospective) clients to switch from wireline to satellite download service. That satellite delivery of downloading is heading to become the dominant delivery method by year end now seems indisputable. The roll out of further cable TV has essentially stopped, often the first generation cable modems have not worked as advertised and the costs associated are very high." (In fact - what Optus is paying for a cable modem will currently purchase all of the parts required for a satellite TV receiving system - editor)

TPG's entry into our business now seems certain. How the competition will respond is less certain. Our Web site "faulting" of their public relations is genuine - 90% of what we know or knew prior to this communiqué was through their PR department. If it looks like a "loser," we believe it was fair to also assume that TPG was similarly badly managed. The writer of the prior report has provided valuable "insider insight" into their plans and we are grateful for this more balanced information. For 99% of TPG's clients, their only personal contact will be through the guy making the satellite installation. If he has the skills of a "trained monkey" and the expertise of the same animal, the public will also quickly develop the same attitude about the firm and its service - no matter how well conceptualised it may be. In our humble view, TPG needs to rethink and then react on its approach to selecting installers, the payment to installers (you get what you pay for) and the level of skills they require from an installer.

1/ The Telstra "buyout" of Ozemail will possibly have been officially announced before you read these words. If you can't beat 'em, buy 'em and then ruin them!

SUPPLEMENT YOUR OWN TRAINING - at home!

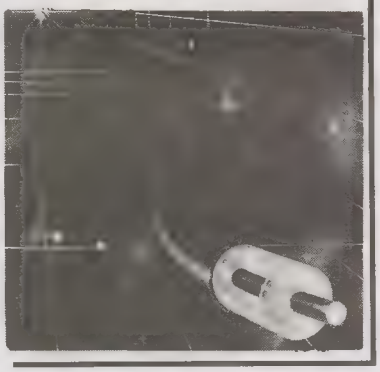
SPACE PACIFIC REPORT

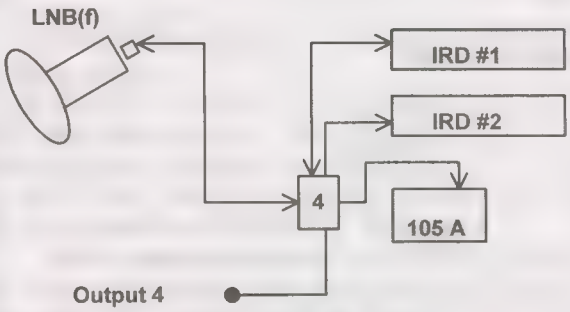
On Mediasat (Optus B3, 12.336Vt, ad-hoc channel 3 or 4; Sr 30.000, FEC 3/4) every Sunday at 0300 UTC (4PM NZ, 2PM Australian Eastern, 11AM Western Australia) repeated at 0700 UTC (4 hours later than first showing).

On Optus Aurora (Optus B3, 12.694Vt, Sr 30.000, FEC 3/4 - requires Aurora card but otherwise FTA) through Westlink channel 23: Restarts Monday January 31 after six week hiatus - Mondays at 8AM WST/11AM AEST, Wednesdays at 10AM WST/1PM AEST, Fridays at 8AM WST/11AM AEST repeated at 12noon WST/3PM AEST.

10 complete one hour programmes created by SPACE Pacific - the trade association - for members and would-be members throughout the Pacific and Asia!
(full programme details page 28, here)

The CABLE Connection





More about digital BER testing

Most now understand that there is a threshold point in carrier to noise ratio (the carrier being the digital signal, the noise being the sum of earth, sky and equipment generated noise) for digital reception. The assumption is that C/N is all that we really have to worry about when lashing together a satellite receiving system using digital transmission technology.

The Unaohm SBM 105A is a very handy way to wring out problems inside of a multiple receiver "headend" system. As we have previously discussed in SatFACTS, C/N is important but not the only important criteria when wiring up a multiple receiver environment system. Impedance match is equally important.

The foibles of DVB-T are explained starting on page 6 in this issue. Much of the concern about terrestrial digital revolves around the almost universal appearance of multiple reception paths between the transmitter site and the receiving location. Reports from those who have spent the last 12 months or more installing outdoor, rooftop aerials for DVB-T are detailed to a fault with the importance of locating the exact spot on a viewer's roof where most of the waves arriving at the directional outdoor antenna are "in phase." That is, there is one all powerful direct signal and those nasty delayed in time ghost images are cancelled simply by being very-very clever and careful in selecting the point where you nail down the antenna. Gone are the careless analogue days when a TV antenna installer could climb onto a roof, look around for the quickest, easiest spot to hang the antenna - stick it there and go back to the ground. War stories about locating a spot on a roof where ghost paths are self cancelling are already a legend in the business. What might take 15 minutes to complete with an analogue antenna system often requires four hours or more with $2,000 in test equipment for digital.

When you insert a 2, 4 or 8 way splitter, or some combination of splitters, into an LNB downline in a "headend" system, to feed two or more separate same antenna - same polarity digital signals to a distribution system, you too are messing with ghosts. The SBM 105 A helps you find those nasty critters.

A ghost signal is one that should not be there. In over the air transmission, it results when the direct signal strikes a solid object, bounces away and ends up at the receiving antenna milliseconds after the direct path signal. In a cable or other multiple receiver environment headend, each splitter you install is capable of creating a ghost signal.

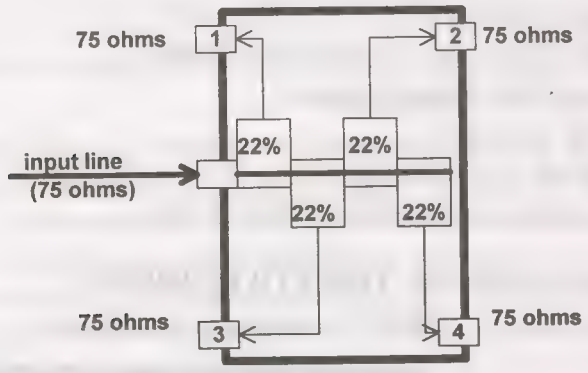
A splitter has an input. If it is the required 75 ohms, that input matches the impedance of the RG6 cable coming from the LNB. Provided - the F fitting you have installed at the end of the LNB downline is itself 75 ohms, and is properly completed with the specified (for that brand and model of F fitting) crimping tool. All pretty basic (see SPACE Pacific Report, 9904).

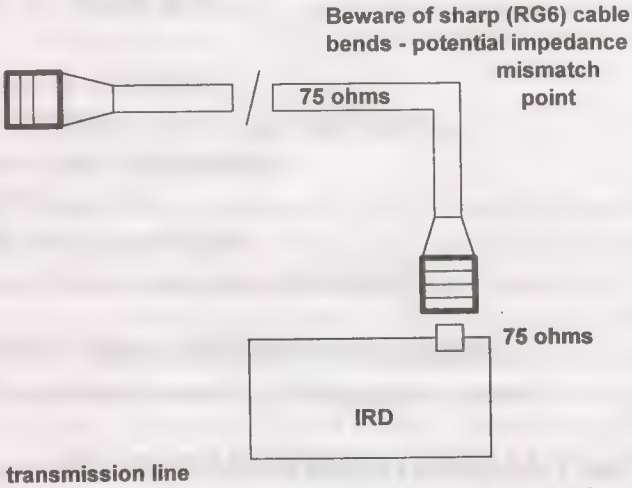
Then the splitter has two or more outputs. One (or all) is power passing, to allow the IRD power supply to send 14/18 volts to the LNB. Between the power passing output and the IRD is a jumper cable, typically the same RG6 type and style as the input line. Similar jumper cables, with two fittings each, connect the additional receivers connected to the same splitter.

The splitter is supposed to do two things:

1) Equally divide the input signal between the outputs

2) Provide the same 75 ohm impedance to all ports - input and outputs.





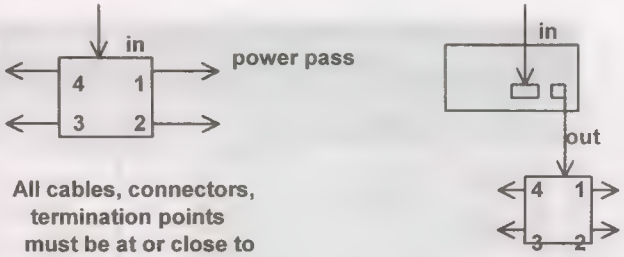
Ghosts (signal reflections) occur when the impedance of the transmission line system between LNB and IRD input is disturbed by a non-75 ohm section or piece. Input power to a 4-way splitter (shown) is partitioned amongst the number of outputs with equal amounts to each output fitting (a minor amount is lost in the splitting).

The goal and assumption is you will have a 75 ohm impedance at all points in the system. Measuring impedance inside of an active (operating) system is a bit complicated. But with the SBM 105A, you can detect where the impedance differs enough to establish "system ghosts." And those "ghosts" inside of a signal division network are just as deadly to the proper operation of satellite digital as signals bouncing off of a neighbour's roof may be to DVB-T.

In the diagram shown on top of p. 22, we have a four-way splitter with two IRDs connected plus the SBM 105A meter (1). The fourth output from the splitter is "open" - a length of RG6 line is connected to the splitter, nothing is connected to the other end.

Set-up the SBM 105A and tune-in one of the digital signals you are processing with the IRDs connected to that splitter. Note the BER (ideally the signal will not be one that floats up and down in level). Now take a 75 ohm resistor and temporarily connect it between the braid and the center conductor on the end of the piece of RG6 hanging out of port 4 of the splitter. Note the effect of terminating the number 4 port with a 75 ohm resistor. The BER on the SBM 105A meter should change when you connect the resistor (previously it was an unterminated port).

Now disconnect the 75 ohm resistor and substitute a value of either 40 ohms or 150 ohms and note the change in BER. This is a deliberate "impedance mismatch" and depending upon the quality of the splitter, the BER will change slightly or a great deal. What you are measuring here is the isolation between port 4 (the test port) and port 3 (where the SBM 105A is connected).



All cables, connectors, termination points must be at or close to 75 ohms or mismatch which creates "ghosts" is created

With SBN 105A ahead of splitter, it "reads" final termination

Now go all the way and remove the 40/150 ohm resistor and simply short the shield/braid to the centre conductor - a dead short, 0 ohms impedance. The BER should go bonkers.

What you are witnessing here is a way to "qualify" splitters, to select brands and models that are better isolated (port to port) than others. You also have demonstrated to yourself a clever way to use the SBM 105A to "clip onto a splitter" in the cable headend and then systematically go through the other cable and connectors connected to the same splitter to see if any of them are marginal, or defective.

Another approach is to connect the LNB to the SBM 105A, and then run a jumper to the input of a splitter under test. The 105A powers the LNB, the BER is read ahead of the splitter but still affected by the splitter that is in series with the instrument because the final termination is the IRDs at the end of the line.

1/SBM 105A review, December SatFACTS, p. 6

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 21 January 2000

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
I703/57E	Sky News	4143/1007R	1	3/4	5(.632)	NDS encrypted, **often FTA**
	CNBC	4018/1132L	1	3/4	6(.000)	Feeds - **typically FTA** (SCPC)
I704/66E	TV5	4055/1095R	4	3/4	27(.500)	**FTA**
	Sky News +	3805/1345R	4	3/4	22(.520)	Sky News 24 hr, sport, feeds; **some FTA**
PAS4/68.5E	Nickelodeon+	4147/1003H	1 reported	1/2	24(.000)	Status unknown - **was testing FTA**
	BBC	3743/1407H	5	3/4	21(.800)	FTA; 2 audio channels
	CCTV	3716/1434H	up to 6	3/4	19(.850)	FTA
Ap2/76E	Hmark/Kermit	3720/1430H	4	5/6	29(.270)	PowVu, typ. CA
	Channel "I"	3823/1327V	1	3/4	3(.570)	Tests, FTA
	TVB8 +	3849/1301H	4	3/4	13(.238)	PowVu, CA
	AXN	3920/1230H	up to 8	7/8	28(.340)	Tests, promos, **some FTA**
Thcm3/78.5E	**ITC+**	3520/1630H	up to 6+	2/3	26(.661)	also try Msym 13.330, FEC 3/4
	ITC	3569/1581H	1	2/3	13(.333)	FTA
	MRTV	3666/1484H	1	2/3	4(.442)	FTA; difficult to load
	~~UTV~~	~~3920/1230H~~	~~6~~	~~3/4~~	~~26(.662)~~	~~Irdeto (MOSC cards were available!)~~
	~~UTV/MCOT~~	~~3880/1270H~~	~~8~~	~~3/4~~	~~27(.500)~~	~~Irdeto (MOSC cards were available!)~~
	Mahar/DD1	3600/1550H	up to 8	3/4	26(.661)	FTA (has included Indian, Egypt)
	PTV2	3420/1730V	1	3/4	3(.366)	FTA, new service, testing
	TV Maldives	3412/1738V	1	1/2	6(.312)	FTA (reaches SE Australia)
	Thai Global+	3425/1725V	up to 7?	2/3	27(.500)	FTA
ST1/88E	**NTSC bouq.**	3441/1709H	2	3/4	5(.800)	Open TV, Cosa TV
MeSt 1/91.5E	**Malay. TV3**	4147/1004H	1	3/4	7(.030)	tests, possibly permanent, FTA
As2/100.5E	**Euro Bouquet**	4000/1150H	5TV, 19r	3/4	28(.125)	FTA (TV5 teletext)
	Reuters	3909/1241H	1	3/4	5(.632)	FTA, occasional feeds
	Hubei/HBTV	3854/1296H	1	3/4	4(.418)	FTA SCPC, teletext
	Hunan/SRTC	3847/1303H	1	3/4	4(.418)	FTA SCPC, teletext
	Guan./GDTV	3840/1310H	1	3/4	4(.418)	FTA SCPC, radio APID 81
	Inn. Mongolia	3828/1322H	2	3/4	8(.397)	FTA: #1 Chinese, #2 Mangolian
	APTN A-O	3799/1351H	1	3/4	5(.631)	FTA SCPC (news feeds)
	WIN Jer/Lon	3790/1360H	1	3/4	5(.631)	Mostly CA; **some FTA**
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	WorldNet/US	3764/1386H	1 + 20 radio	3/4	6(.100)	FTA; up to 20 radio channels
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)	FTA SCPC, radio APID 256
	Jiangx/JXTV	3727/1423H	1	3/4	4(.418)	FTA SCPC, teletext, radio APID 81
	Fujian/SETV	3720/1430H	1	3/4	4(.418)	FTA SCPC, + radio APID 80
	Hubei TV	3713/1437H	1	3/4	4(.418)	FTA SCPC, radio APID 80
	Henan/Main	3706/1444H	1	3/4	4(.418)	FTA SCPC, + radio
As2/100.5E	**Korea feeds**	4090/1060V	1	3/4	10(.320)	FTA SCPC/MCPC
	TVSN	4033/1117V	1	3/4	4(.298)	FTA, not same as Aust. version
	Sky Racing	4020/1130V	up to 3TV	1/2	18(.000)	(Irdeto) CA; **1 & 3 occ. FTA**
	EMTV	4006/1144V	1TV, 2 radio	3/4	5(.632)	PowVu CA; poor signal level
	Jilin Sat TV	3875/1275V	1	3/4	4(.418)	FTA SCPC, + radio
	HeiLongJian	3834/1316V	1	3/4	4(.418)	FTA SCPC
	JSTV	3827/1323V	1	3/4	4(.418)	FTA SCPC, + radio
	Anhui TV	3820/1330V	1	3/4	4(.418)	FTA SCPC
	ShaanxiQQQ	3813/1337V	1	3/4	4(.418)	FTA SCPC, radio APID 81
	Guan/GXTV	3806/1344V	1	3/4	4(.418)	FTA SCPC, radio APID 257
	Fashion TV	3796/1354V	1	3/4	2(.533)	FTA SCPC, now easy to load
	Feeds	3785/1365V	1	3/4	5(.632)	FTA & CA, feeds
	Myawady TV	3766/1384V	1	7/8	5(.080)	FTA SCPC - difficult to load
	Saudi TV1	3660/1490V	1 (?)	3/4	27(.500)	FTA MCPC + radio
As3S/105.5E	**Arirang TV**	3755/1395V	1	7/8	4(.418)	FTA SCPC; very strong signal
	Star TV	3780/1370V	17(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	14(+)TV	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3880/1270H	12(+)TV	7/8	26(.850)	NDS CA (Pace DVS211, Zenith)
	CNNI	3960/1190H	4(+)TV	3/4	26(.000)	PowVu CA; some **FTA** feed channels
	Star TV	4000/1150H	7(+)TV	7/8	26(.850)	NDS CA (Pace DVS211, Zenith)
	Zee Bouquet	4020/1140Vt	4+TV	3/4	27(.000)	Testing, service on/off, up to 8 promised
Cak1/107.5E	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+) TV	5/6	20(.000)	NDS CA using RCA/Thomson, Pace IRDs; improved reliability since June
Sinosat/110E	**CCTV2**	3889/1261Hz	1	3/4	3(.000)	FTA SCPC, difficult to load
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA; may be test
	Indosiar	4074/1076V	1	3/4	6(.500)	May only be test - not reliable
	Anteve	4055/1095V	1	3/4	6(.510)	FTA SCPC; may be test
	Space TV	4000/1150H	11TV, radio	3/4	26(.666)	CA, sometimes FTA
	C Net Taiwan	3760/1390H	11TV, radio	3/4	26(.666)	CA, subs available -10 radio FTA
	RCTI	3475/1675H	1	3/4	8(.000)	FTA SCPC; may be test
JcSAT3/128E	Miracle Net	3990/1160V	3 up to 6	5/6	12(.997)	PowerVu; **TBN #3 FTA**, some CA
	Asian bouquet	3960/1190V	up to 8	7/8	30(.000)	CA and **FTA**, Japan, Taiwan, China

"NDS"

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
L AP1/130	**THT+NTV**	3675/1475L	2 + 2 radio	3/4	12(.000)	inclined orbit +/-2.4 degrees
Ap1A/134e	**Gansu TV**	3769/1381V	1	1/2	6(.930)	FTA SCPC (NT, Aust only)
Ap1/138e	**Reuters**	3742/1408V	1	3/4	5(.632)	FTA SCPC (NT, Aust only)
	Viacom	3860/1290V	up to 6	3/4	30(.000)	**FTA**, CA (NT, Aust only)
Opt B3/156	Mediasat	12.336V	6+TV, 3+ radio	2/3	30(.000)	PowVu but **mostly FTA**; TRT ++
	Aurora	12.407V		2/3	30(.000)	CA, $105 smart card required (p. 28)
	Aurora	12.532V		2/3	30(.000)	CA, $105 smart card required (p. 28)
	Aurora	12.595V		3/4	30(.000)	CA, $105 smart card required (p. 28)
	Aurora	12.720V		3/4	30(.000)	CA, $105 smart card required (p. 258
	Optus/Test	12.376H		3/4	29(.473)	feeding parallel 12.698, test
	Austar/Foxtl	12.438H		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.564H		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.626H		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.688H		3/4	29(.473)	CA, subscription available Australia
Opt B1/160	**ABC NT fd**	12.256V	1TV, 3 radio	3/4	5(.026)	FTA, Sydney -30 minutes time zone
	Central 7	12.354H	1TV	3/4	3(.688)	FTA, purpose here unknown
	Imparja TV	12.367H	1TV, 3 radio	3/4	5(.424)	FTA, purpose here unknown
	Sky NZ	12.391/418V		3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.518/546V		3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.643/671V		3/4	22(.500)	NDS CA, subscription available NZ
	Imparja fd.	12.367H	1	3/4	5(.424)	FTA, difficult to load, full time?
PAS8/166E	Pacific Time	12.286V	10TV	3/4	26(.470)	Viaccess CA, some **FTA** at times
	ABCInterch	12.312H	1	3/4	6(.978)	PowVu, FTA, news feeds
	ABCInterch	12.321H	1	3/4	6(.978)	PowVu, FTA, news feeds
	Pacific Time	12.326V?	8TV	3/4	27(.500)	Viaccess CA, some **FTA** at timres
	ABCInterch	12.330H	1	3/4	6(.978)	PowVu, FTA, ABC Melbourne feeds
	Pacific Time	12.366V	9TV	3/4	26(.470)	Viaccess CA, some **FTA** at times
	TARBS	12.526H	12+ TV	3/4	28(.067)	'MDS' CA, IRDs useless other svcs
	Boomerang	12.725H	5+TV	7/8	25(.728)	TPG FTA + April start Internet
	NHK Joho	4065/1085H	5TV, 1 radio	3/4	26(.470)	PowVu CA & **FTA**; subscription avail
	DiscovryTest	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA test, same as PAS2 3776H
	CalBqt/Pas8	3940/1210H	up to 5TV	7/8	27(.690)	PowVu CA & **FTA (EWTN)**
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowVu, FTA at this time
	MTV Test	3740/1410H	4	2/3	27(.500)	PowVu, intermittent tests, CA+**FTA**
PAS2/169E	Pv Bouquet	~~12.281V~~ 29K	2+ TV, radio	~~3/4~~ 2/3	27(.500)	PowVu CA, WIN, ABC NT
	WA PowVu	12.637(.5)	4TV, 8 radio	1/2	18(.500)	PowVu CA, WA only - D9234
	TCS-Singap	4183/967V	2	1/2	6(.620)	PowVu FTA - reported closed down (?)
	HK PowVu	4148/1002V	up to 8	2/3	24(.430)	PowVu CA, **some FTA**
	NBCHonKn	4093/1057V	5, up to 7	3/4	29(.473)	Philips MPEG-2, FTA
	Fox Bouquet	3989/1161V	8TV/data	7/8	26(.470)	Pv, CA/FTA (**Fox News USA**)
	Feeds	3942/1208V	1 or 2	2/3	7(.497)	(PowVu) FTA, occ. feeds
	~~ESPN USA~~	~~3860/1290V~~	~~7TV, 2 data~~	~~7/8~~	~~26(.470)~~	~~PowVu CA, CA 12 bootloader updates~~
	Middle East	3778/1372V	4	3/4	13(.331)	FTA - testing CA, "threatening"
	Service 1	3761/1389V	1	3/4	6(.620)	(PowVu) FTA, occ. feeds
	CCTV Pv	3716/1434V	5 typical	3/4	19(.850)	(PowVu) FTA, # pgm chs varies
	NTV Japan	4174/976H	1	3/4	5(.632)	FTA SCPC feeds (occasional use)
	Feeds	4138/1012H	1	3/4	6(.620)	FTA occasional feeds
	7thDyAdven	4034/1116H	1TV, 14 audio?	3/4	6(.620)	1900-2030UTC; also see 3957H
	CNNI HK	3996/1154H	1	3/4	9(.998)	Reverse link HK to Atlanta, feeds, FTA
	Feeds	3867/1183H	1	2/3	6(.618)	FTA occ. (sport) feeds
	7thDyAdven	3957/1193H	1TV, 14 audio	3/4	7(.000)	1900-2030UTC; not daily, PowVu FTA
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)	FTA-typ. NTSC-occ. sport, shuttle
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)	(PowVu) CA & **FTA**
	Disney	3804/1346H	3	5/6	21(.093)	PowVu CA
	Discovry Sng	3776/1374H	8 typ	3/4	21(.093)	PowVu CA
	Satcom 1-6	3743/1407H	up to 5	7/8	19(.465)	currently FTA, lowlevel, Mid East feeds
I702/177E	AFRTS	4177/973LHC	8TV, 12+ rad	3/4	26(.694)	PowVu CA
	ThaiBouqut	12.650H	up to 3 TV	1/2	17(.800)	Thai5 service, tests, FTA
I701/180E	Canal+ Sat	11.610H	16TV, 1 radio	3/4	30(.000)	Mediaguard CA, some occ. FTA
	TVNZ	4195/955RHC	1	3/4	5(.632)	DMV/NTL occ. feeds, typ CA
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)	DMV/NTL occ. feeds, typ CA
	TVNZ	4178/972RHC	1	3/4	5(.632)	DMV/NTL occ. feeds, typ. CA
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)	DMV/NTL occ. feeds, typ. CA
	RFO-Canal+	4095/1055L	7TV, 5+ radio	3/4	27(.500)	#1, 2 CA - **rest FTA-France to Polyn.**

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(I701/180E)	**TVNZ feeds**	4044/1106R	1	3/4	5(.632)
	NZ Prime TV	4024/1126L	1	2/3	6(.876)
	RFO Polycast	3858/1292L	1	3/4	4(.566)
	TVNZ (TL)	3854/1293R	1	3/4	5(.632)
	TVNZ	3846/1304R	1	3/4	5(.632)
	10 Australia	3765/1385R	6	7/8	29(.900)

Receivers and Errata
SCPC, mixed CA and **FTA** feeds
PowVu CA; Auckland net feeds
FTA SCPC; East Hemi Beam-Tahiti
SCPC, mixed CA & **FTA**, feeds
SCPC, mixed CA & **FTA**, feeds
PowVu CA & **FTA; #3 TBN**

BOUQUETS - FTA vs. CA: Listings here show SCPC (single channel per carrier) and MCPC (multiple channels per carrier) digital transmissions which "more or less" conform to the MPEG-2 DVB "standard." Unfortunately, "conforming to the standard" is interpreted differently by the various transmission equipment suppliers - of which, Scientific Atlanta is the most notorious with its PowerVu proprietary (that means "unique to SA") method of creating MPEG-2. If you want to see REAL MPEG-2 DVB-Compliant (as in world standard) signals - try AsiaSat 2, European Bouquet (4000/1150Hz). SA "modifies" their PowerVu format in an attempt to force each programmer using its uplink equipment to also use its proprietary (PowerVu) receivers. PanAmSat, closely linked to Scientific Atlanta, virtually insists that any digital service user of their satellites use PowerVu format transmission equipment. The good news is that some clever non-PowerVu receiver designers and receiver software writers have created "quasi-PowerVu" decoding routines which in many cases outperform the PowerVu originals. If your use requires access to one or more PowerVu CA (conditional access) service, you have no choice but to purchase a PowerVu receiver. If you are only interested in FTA (free to air) PowerVu services, there are many lower cost options (see below).

All services listed in bold face (i.e. **Arirang TV**) are FTA. When MCPC services are FTA, they are also listed bold face (i.e. **Euro Bouquet**). When there are mixed CA and FTA programme channels in a MCPC bouquet, see right hand column for a bold face indication of this (i.e. **some FTA**). The primary (mostly or total) FTA MCPC bouquets are as follows: PAS4/68.5E: CCTV (3716H); Thaicom 3/78.5E: Mahar (3600H), Thai Global (3425V); As2/100.5E: European Bouquet (4000H); Optus B3 /156E: Mediasat (12.336V); PAS8/166E: NHK Joho (4065H), California Bouquet (3940H), CNNI (3780H); PAS2/169E: NBC Hong Kong (4093V), Middle East (3778V), BBC + (3743V), CCTV (3716V), California PowVu (3901H), Satcom 1-6 (3743H); Intelsat 701/180E: RFO (4095LHC), 10 Australia (3765RHC). There are far more SCPC FTA digital services than MCPC FTA digital services.

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

ADI MediaMate. FTA, NTSC+PAL outputs. (Pacific Digital Sys. Pty Ltd, tel 61-2-8765-0270)
AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM Pty Ltd, 61-2-9949-7417.
Benjamin DB6600-CA. FTA, Foxtel/Austar w/CAM+card. Try Steffen Holzt ++687-438-156.
Grundig DTR1100. Mfg by Panasat (SA), very similar to Panasat 630; out of production, Irdeto capable. See Av-COMM above.
Humax F1-CI. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).
Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26) (Dec 99 - serious glitch with EBB reception)
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8906.
Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. Int. 61-2-9618-5777
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. Tricky to use.
Nokia 9200. When equipped with proper CAM, does Aurora, pay-TV services provided software has been "modified" with Dr Overflow or similar program (www.BAKKERELECTRONICS.COM- Note: This site shut-down by Mindport early November - may not be functioning!). Reported factory 12 mo. warranty. Peter Older, tel 61-3-5133-7911, mobile 61-0418-386287
Nokia 9500/9600. Numerous versions for different world parts; not distributed in Pacific but assistance from Av-Comm Pty Ltd.
Nokia 9800. Latest single chip version, with CI and Irdeto capable. No software for Pacific, Asia; not recommended.
Pace DVS211. NDS CA (no FTA) for Star Asia, previously used for Indovision. (Solution 42, 61-2-9820-5962)
Pace DGT400. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818)
Pace DVR500. Original DGT400 modified for NBC (PAS-2) affiliate use, with CAM equivalent to DGT400 but more reliable.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.
Pacific Satellite DSR2000. Advises no longer current model (see. p. 2, here); Clone of Mediastar D7 (see above)
Panasat 520/630/635. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370.
Panasonic TU-DS10. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but no longer available in Australia.
Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222 out of production
Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review Nov. 1998. SATECH 61-3-9553-3399.
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerCom. FTA, PowVu, NTSC, excellent sensitivity. NetSat 61-2-9687-9903.
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.
Praxis/DigiMaster 9600 MKII/9800AD. FTA, PowVu+analogue, withdrawn from sale in Pacific (was Skyvision-below)
Praxis 9800 ADP. FTA SCPC/MCPC, PowVu, analogue, positioner. SF review Dec '98; withdrawn from Pacific sale (below).
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-2-6292-5850, Telsat 64-6-356-3749)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - review this issue (Skyvision - see above).
Skandia SK888 (aka DigiSkan-SMS). FTA MCPC, Irdeto CAM+software upgrade. Out of production; Skandia 61-3-9819-2466
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. SATECH 61-3-9553-3399.
Sky 21/SJ 3000ci. Claims "clone" Hyundai HSS800ci; if so, poor copy. Runs very hot, reportedly burns up smart cards
UEC642. Designed for Aurora (Irdeto), approved by Optus; limited other uses. Nationwide 61-7-3252-2947.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - above); power supply problems.
Xanadu. DVB compliant special receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9949-7417)
Yuri HSS-100C. FTA, clone of Hyundai, V2.27 software custom to Australia (Nationwide-above).

Accessories:
Aurora smart cards. New v1.6 now available, 1.2 no longer available for RABS. Price now A$105, Sciteq 61-8-9306-3738.
PowerVu Software Upgrade: PAS-2, 3860/1190V, 26.470, 7/8; Tune pgm ch 12 and follow instructions (do not leave early!)

SatFACTS Pacific/Asian FTA ANALOGUE Watch: 21 January, 2000

BIRD/ Location	RF/IF & Polarity	Service	Errata
I703/57E	3808/1342R	Udaya TV	
	4052/1098R	WorldNet	VOA subcrs.
	4178/972L	MTA Inter.	
I604/602/60E	4166/984	various feeds	
I704/66E	3765/1385R	tests	
	4015/1135L	Mongolia	(SECAM)
PAS4/68.5E	3743/1407V	RTPi	(+ radio subcr)
	3864/1286V	BBC World	
	3907/1243H	Sony TV	Hindi
	4034/1116V	Doordan	(various)
	4087/1063H	CNNI	
	4110/1040H	TNT/Cartoon	
	4113/1037V	Series Ch.	
	4182/968H	MTV	
PAS7/68.5E	3470/1680V	test signal	
AP2R/76E	3745/1405V	Vasta Music	(P5 in NSW)
	3691/1459V	TEN	
Thaicom3/78E	3871/1279H	TVT	
	3760/1390V	Army TV	
	3690/1460V	MRTV	
	3685/1465H	Myanmar TV	+ radio 7.6
	3616/1534V	ETN	
	3576/1574V	ATN Bangalr	Bengali
	3554/1596V	Gurbani Ker.	
	3536/1614V	Punjabi TV	(occ service)
	3514/1636V	Falak TV	
	3489/1661H	Vasta Music	occ tests
	3465/1685V	RAJ-TV	
Express 6/80E	3672/1478L	TK Rossija	(north beam)
InSat 2E/83E	3481/1669V	Sun TV	
	3575/1575V	Vijay/Asianet	aud. 5.5/6.6
	3810/1340V	DD1-Tamil	"
	3850/1300V	DD1-National	"
	3930/1220V	DD2 Metro	"
	3970/1180V	Teluga 1	"
	3998/1152V	sport feeds	"
	4035/1115V	Sun TV	"
	4060/1090V	Surya/Sun TV	"
	4093/1057V	DD7	"
ChnStr1/87.5E	3880/1270H	occ feeds	P4 NSW, Ntsc
ST1/88E	3550/1600V	test card	
	3582/1568V	Nila TV	(vintage TV)
CIS S6/90E	3675/1475R	RTR1	P3 NSW
	3875/1275R	Orbita 1	
	3916/1234R	RTR II	
	3935/1215R	Orbita II	
MeSat-1/91.5E	3710/1440H	VTV1,2, 4	
	3880/1270H	RTM-1	
InSat 2B/93.5E	4165/985H	India Metro	NSW on 3.7m
	4125/1025V	India National	NSW on 3.7m
	4080/1070V	DD7 (Tamil)	
	4070/1080H	DD9	
	3970/1180V	DD9 (Kan.)	
	3882/1268V	DD1	
	3840/1310V	DD?	
	3762/1388V	DD4	
AsSat2/100.5E	3642/1508H	ERTU Egypt	
	3660/1490V	feeds, tests	
	3680/1470H	feeds	
	3860/1290V	feeds	

BIRD/ Location	RF/IF & Polarity	Service	Errata
(As2/100.5E)	3885/1265H	WorldNet	VOA subcrs
	3960/1190H	CCTV4	
	3980/1170V	RTPi	+5 radio svcs
CIS S21/103E	3675/1475R	RTR	
	3875/1275R	Vrk Apt	
AsSat3S/105.5	3660/1490V	Z-Marathi	audio 6 6
	3680/1470H	CETV	
(temp FTA)	3800/1350H	Star Sport	NTSC
(temp FTA)	3840/1310H	Channel [V]	NTSC
	3900/1250H	AlphaTV Punja	
(temp FTA)	3920/1230H	Phoenix Ch	NTSC
	3940/1210V	Zee India	
	3980/1170V	Zee TV	
	4140/1010V	Angla Bangla	
	4060/1090V	Zee Cinema	(Starcrypt)
	4100/1050V	PTV2/World	
	4120/1030H	CCTV	NTSC
T'kom1/108E	4000/1150H	tests	
PalapC2/113E	4160/990H	(France) TV5	
	4140/1010V	Brunei + feeds	
	4120/1030H	MTV Asia	
	4080/1070H	Herbalife	+ tests
	4040/1110H	CNBC	
	3970/1180V	CNNI	
	3880/1270H	Aust ATN7	
	3840/1310H	TVRI	tests
	3742/1408V	RCTI	English subcr
AsSat1/122E	3677/1473V	Test card	& 3933/1217H
ChinS 6/125E	4085/1065V	feeds	seldom seen
JcSat3/128E	3768/1382V	feeds	occ., P5 NZ
	4085/1065V	test card	NTSC. 6.8 aud.
Ap1A/134E	4160/1050V	CETV	
	3980/1170V	CETV1	
	3900/1250V	CETV2	
Ap1A/138E	4160/990H	CCTV7	
S7/140E	3675/1475R	ORT Moscow	+/-4d. inclined
	3875/1275R	feeds, tests	
LMAP2/142.5	3675/1475L	occ. tests	+/- 3 deg inc.
Ag2/146E	3787/1363H	GMA	P1/2 s. eqtr
Me2/148E	4080/1070H	test card	occ. use
PAS8/166.5E	3880/1270V	test card, feeds	not full time
	3865/1285H	Napa test card	not fulltime
PAS2/169E	3940/1240V	Napa test card	
1802/174E	4166/984R	Feeds	
	4177/973R	Feeds	
I702/177E	4166/984R	Feeds	inc. KBS Korea
	4187/963R	Occ. feeds	
I701/180E	3810/1340R	Occ. feeds	
	3841/1309L	RFO	East Beam
	3845/1305R	Occ. feeds	inc. from USA
	3930/1220R	USA net feeds	FTA & encrypt
	3975/1175R	Occ. feeds	

PAS4/68.5E	3785/1365V	Discovery India	BMAC
	3860/1290H	ESPN India	BMAC
Ap2/76E	3960/1190H	HBO Asia	GI Digicipher2
C2/113E	3930/1220H	Filip. Peo. Net	GI 1.5 MPEG
Ap1/138E	4100/1050V	ESPN	BMAC
PAS2/169E	4028/1122H	ABS/CBN	GI 1.5 MPEG

TECHNICAL INFORMATION

Cross-pole isolation: When a C (or Ku band) satellite operates with linear polarisation, it is "sharing" the same 500 MHz (+) downlink bandwidth between two totally independent sets of signals. One set is "Horizontal" (H or Hz) and the other is "Vertical" (V or Vt).

Horizontal and vertical transponders are frequency offset by some small amount - typically 20 MHz - to assist in keeping the HZ signals from getting into the Vt spectrum. But with digital transmissions, the old reason for offsetting transponders on opposite (Vt or Hz) polarisations is now gone.

If you have a LNB with 14/18 volt, 22 kHz or some other form of "polarisation switching", the receiver selects which polarity it "sees" at your instruction. A polarisation rotation device (Polarotor-tm) does the same thing but is under user control through a continuously variable control.

If the polarisation adjustments on the LNB probe feeds are not set precisely on the mark, a Vt probe will see some Hz signal and vice versa. This is called "cross-pole interference" and with analogue signals it causes sparklies in one or both sets of video because transmission power from one polarity "leaks" into the receiver from the "opposite pole" (polarity). In the photo here, a "dual pole feed" which involves a single scalar ring antenna connected to a piece of transmission line (waveguide) "pipe" in turn connected to a "Y" arrangement which electrically "splits" the opposite polarities into two separate "flange fittings" at the end of the feed. This is where two separate LNBs are attached - one for vertical and one for horizontal, allowing simultaneous reception through two downlines of each polarity. Notice the pen marks just right of centre. By connecting a spectrum analyser to either the Vt or Hz line and rotating the collar (line between pen marks) in a circle, you can locate the point where the LNB probes (moving with the rotating collar) are (1) peaked for maximum one-polarity signal, and, (2) null (eliminate) the opposite polarity signal. In all cases you tune NOT for maximum peak but rather for maximum NULL - the null occurs where the unwanted polarisation is at its lowest level.

TUNING IN THE INDUSTRY'S TV PROGRAMME

SPACE Pacific, the Asia-Pacific industry membership trade association, has produced (and continues to produce) a series of one hour television programmes. These "SPACE Pacific Report" shows, hosted by Bob Cooper, cover a range of topics of interest to installers and enthusiasts. Show numbers and content are as follows: **#9901-** Spectrum Analyser techniques, **#9902-** Feeds and LNBs, **#9903-** Dish antenna designs and problems, **#9904-** The dish marketplace, and, "tiny parts," **#9905-** Dr Overflow (Nokia) software, **#9906-** How the uplink works (tour of RCA's Vernon Valley site), **#9907-** Uplink Two, including uplink transmitters, **#9908-** Digital Basics (Mark Long), **#9909-** Real World Installs (Mark Long), **#9910** - Installing a polar mount dish (in production); "Report" is broadcast by Mediasat on Optus B3, 12.336Vt, ad-hoc channel 3 (SR 30.000, FEC 2/3) with the following coming-weeks schedule: **Sunday January 23** - Show 9901 - 0300-0400 UTC (1600 NZDT, 1400 AESummerTime, 1100 Western Australia; repeats 0700 UTC). **Sunday 30** - Show 9902, same times as January 23; **Sunday February 6** - Show 9903, same times as January 23; **Sunday February 13** - Show 9904, same times as January 23; **Sunday February 20** - Show 9905, same times as January 23; **Sunday February 27** - Show 9906, same times as December 19(*Premiere showing*). SPACE Pacific Report is also broadcast by Westlink, Aurora service on Optus B3, vertical (12.634, SR 30.000, FEC 3/4 - requires Optus Aurora card but is otherwise FTA). Schedule is Monday, Wednesday and Friday as follows: Mondays: 8AMWST/11AM AEST; Wednesdays 10AM WST/1PM AEST; Fridays 8AM WST/11AM AEST repeated 12noon WA/3PM AEST. Show schedule: Week **of January 31, February 2, 4**: Show 9908; week of **February 7, 9 and 11**: Show 9909; week of **February 14, 16 and 18**: Show 9910; week of **February 21, 23, 25**: Show 9901. Westlink is in "hibernation' during the holidays, off the air from December 17 to January 31. SPACE Pacific attempts to pre-announce which show(s) will appear through the SatFACTS Web site prior to each weekend (http://www.satfacts.kwikkopy.co.nz). Shows are digitally mastered and VHS copies are available from SPACE Pacific - see insert card between front cover and page 1 here.

Sponsorship of SPACE Pacific Report. In general answer to queries - AvComm, Satech and Sciteq have contributed corporate funding to make possible the production of the first set of ten SPACE Pacific Report programmes. Funds derived from sale of VHS tape copies are also an important element to meeting the $1,300 overhead of each show. Mediasat and Westlink donate the time to broadcast the programmes, and both are to be commended for this support. As we move into the next group of (10) programmes now being scripted and shot, we solicit financial support from members of the industry with commercial activities they wish to have associated with the project. To discuss your own support, contact Bob Cooper at telephone 64-9-406-0651, fax 64-9-406-1083, e-mail Skyking@clear.net.nz. C-band wide area service is still being negotiated.

WITH THE OBSERVERS

AT PRESS DEADLINE

Promised Optus B3, Vt addition of two Indian language TV channels through Aurora platform still has uncertain start date. One channel is Punjabi, 2nd still not announced. Transponder will be 12.532Vt, will be FTA for first 60 days, footprint to include NZ (90cm or smaller dish) - updates our Web site.

ApStar 2R/76E: TEN TV (analogue) has moved from 3770/1380Vt to 3691/1459Vt and is much stronger now (**D. Leach**, NSW).

AsiaSat 2/100.5E: Saudi TV Channel 1, SCPC, reportedly turned off 3661 and 3740Vt and reappeared on 3660/1490Vt in MCPC format, Sr 27.500, FEC 3/4 - more programme channels coming? Also tested briefly on 3740 with Sr 27.500. Final - we suspect - "Official word" detailing why European Bouquet went bonkers with many IRDs late in November, from DW: "The disturbance on As2 followed a software update on 23 November. IRDs with Irdeto software (Pace DVR500, Panasat, Grundig, Hyundai HSS100C) did have problems. Except for the Hyundai, the IRDs were operational after a reset and new download. The Hyundai IRD turned out to be incompatible with MPEG2/DVB standard of the updated software. After contacting Hyundai, EB has again modified the data stream software to accommodate the HSS100C variance from MPEG2."

AsiaSat 3R/105.5E: Star TV is "negotiating" with AsiaSat for additional transponders - stay tuned. Alpha TV Bangla and Alpha TV Punjabi 4020/1140 VT (Sr 27.000, FEC 3/4, PowerVu-FTA) are on and off at irregular times - Music TV Asia is more often functional (**S. Johnson**, NZ). It appears the signal levels and preparation for launching this up-to-8 channel digital service are not yet mature - ed. NOW TV promo (of little entertainment value) now 3760/1390Vt, Sr 26.850, FEC 7/8.

Cakrawarta 1/107.5E: The (original) Star Indovision IRDs cannot be used for any service other than Indovision - reason - Flash Memory in IRD is "different" than others.

Gorizont 33/145E: "Lucky us." The last, stored in a shed, unused Gorizont - #33 - has finally been assigned to 145W with Proton launch "sometime in 2000." Alas, this is still an inclined orbit (by design) bird - luckier folks near 80E will get Express A2 which if nothing else is geostationary - also "sometime in 2000."

InSat 2E/83E: Asiasat - the channel, not the satellite - tests reported 3577/1573Vt, Sr 3.978, FEC 3/4.

Intelsat 701/180E: Canal Satellite (11.610Hz, Sr 30.000, FEC 3/4) passed 5,000 subscriber sign-ups 35 days after launch, far more than 3,000 projected. Yes, service does work in "grey" areas of Australia on smaller dishes, not in NZ however on any reasonable size dish. Yes - French Adult service XXL is now daily operating.

Peter Cook in Queensland: "The 90cm (Ku) dish is attached to a 3.7m C-band and in this position will receive Optus B1/B3, PAS 8 using the positioner in the normal way. The satellites are reasonably close together and at this location are not far from due-north."

Optus B1/160E: PAL analogue feeds reported 12.636Hz. Imparja FTA service feed on 12.364Hz, Sr 5.424, FEC 3/4 excellent here on 1.2m dish - Austar has been advertising $19.95 installation special here (D. Leach, NSW). Sky Network NZ test on 12.670Vt (Sr 22.500, FEC 3/4) has had MCM, occasional video feeds FTA. Sky planning additional (CA) pay-TV services here shortly (**Mathews**, NZ).

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for February15th issue: February 5 by mail (use form appearing page 34), or 5PM NZT February 6th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

STAR TV Asia "Piracy Control Policy"

As quoted from policy memo distributed throughout Asia by STAR TV to installing distributors of their equipment and services.

"*We conduct verification* of all data provided by purchasers of our digital satellite receiver equipment (following information provided by the installer on the) Customer Account Activation Form and the Purchaser Information Forms (such as, installation address, purchaser type, number of SMATV outlets and so on). If discrepancies are found due to false/inaccurate declarations by either the end user, the installer or both, we will have to take measures to protect the integrity of our business and to ensure compliance with the local laws in the countries in which we distribute our services. For example, in certain countries (e.g. China) all decoders must be imported and sold through our appointed distributors.

"*The action will include* the steps described below:

"1) *A warning letter* will be issued to the installer/end user in response to the false/inaccurate declaration.

"2) *The price of our equipment* may vary from country to country. If equipment purchased in one country and declared for use in that country is found to have been installed in another country, the installer/end user will have to pay STAR TV within 14 days of the date of the warning letter any differential for the country of actual installation.

"3) *Further, the installer/end user* must resubmit its Customer Account Activation Form(s) to STAR TV declaring completely accurate details within (14) days from the date of the warning letter.

"4) Should the installer/customer fail to do so, a second warning letter will be issued.

"5) *If no appropriate action is taken* by the installer/end-user, STAR will have the right to immediately suspend access to the service and/or terminate the (service) (installer) agreement without further notice. If the installer/customer subsequently complies with the warning letters and requests re-activation of access to the service, the installer/customer will have to pay a re-activation fee determined by STAR.

"*In addition to the above*, STAR TV also reserves the right to claim an indemnity from the installer against loss, expense claims and damages suffered by STAR TV resulting from or in any way connected with non-compliance of the Terms and Conditions of Sale of the equipment. "

Operations & Customer Services

STAR TV

Optus B3/156E: All (10) radio service channels on 12.564 and 12.626Hz are now encrypted. Optus has fired up 12.376Hz at Sr 29.473, FEC 3/4 essentially duplicating 12.689Hz (but subject to change) - something new coming here?

Palapa C2M/113E: RCTI is - contrary to reports - solid here at 3475/1675Vt, Sr 8.000, FEC 3/4. Some English language TV programming from USA, UK (D. Leach, NSW). Mega-TV (pay package) reported gone from this satellite (was 3780/1370Vt), possibly to (unknown frequency on) Measat 1 (91.5E). Star FM 106.9 has replaced VOA as audio subcarrier on 3880/1270Hz, 8.10MHz - Australia ATN7. Latest channel line-up for C-Net Taiwan (3760/1390Hz), Sr 26.666, FEC 3/4) for those occasional unannounced period when the CA quits: (10) Ch. 12, (11) Globe, (12) Formosa 2, (13) Formosa 1, (14) CTV, (15) TTV, (16) Sun Enjoy, (17) BBC World, (18) Fashion TV, (20) - open -, (21) CTS. Additionally, channels 1 to 10 are FTA radio/audio services you can listen to while waiting for the CA to quit ... again (**S. McLeod**, NZ).

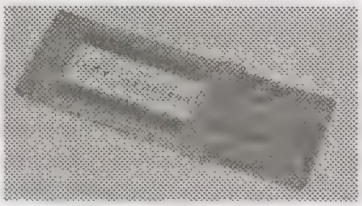
PAS 2/169E: TCS International, 4183/967Vt appears to have shut down (some reports say it has gone CA) (D. Leach, NSW). Fox TV News USA is FTA, 7 others CA (sport feeds) on 3989/1161Vt, Sr 26.470, FEC 7/8 - not easy to load. ABS-CBN Digicipher 1 format has moved from 3836Hz to 4028/1122Hz. Telstra test on 12.281Vt, Sr 27.500, FEC 2/3 in December had WIN-TV and ABC North as programme sources (**D. Nolan**).

PAS 8/ 166E: New numbers for Discovery service here on 3980/1170Hz are Sr 27.690, FEC 3/4 (**R. Brooks**, Marshall Islands). Boomerang TV is testing with 5+ FTA channels on 12.725, Sr 25.728, FEC 7/8 (**Bill Richards**, Australia) (the FEC is of course ill advised but suggests they plan to use the transponder for far more than 7 to 8 TV channels announced. It also makes a mockery of their claims that installers can "convert" ex-Galaxy/Austar /Foxtel 60cm dishes to this use - somebody has not done their homework! -ed.) CNN, CNN fn (financial network) are included along with Animal Planet and at times - TNT/Cartoons (**Ernie Wright**, NSW). MTV (Asia) continues testing on 3740/1410Hz, Sr 27.500, FEC 2/3- not fulltime. CNBC is moving here from PAS-2, will start simultaneous feeds around 1 February, plans to shut down PAS-2 service on March 31. Encryption status after move not announced. CNNfn (financial news net) has been added to 3780/1370Hz, Sr 25.000, FEC 3/4 (FTA at this time).

ST1 - 88E: Global TV and Tzu Chi TV are now on 3509/1641Hz, Sr 23.433, FEC 3/4 - with many others.

Thaicom 2/120E: TVT (Ch 11) reported 3865/1285Hz, Sr 4.687, FEC 3/4.

Thaicom 3/ 78E: ATN World is no longer at 3594/1556Vt. Gurbani Keertan has replaced Raaj Plus on 3554/1596Vt (Asian beam). PTV2 reported on 3420/1726Vt, Sr 3.366, FEC 3/4.



Irdeto CI module.
Picture for illustration purposes. Card is inserted chip facing upwards for correct operation

AT Sign-off

Water under the bridge

A 29 page report detailing the ABA investigation of why the Western Australia transition from B-MAC to digital was so fraught with problems has been posted on their web site recently.

For those with a short memory, GWN decided it would not become a client of Optus for the Aurora project in mid 1997, electing to go with Telsat which offered them bouquet space on PanAmSat PAS-2. GWN was to begin simulcasting (B-MAC and digital) in September of 97; in fact, it would be December before the PAS-2 service appeared. The B-MAC termination date, on the assumption all GWN viewers would have traded their B-MAC for PowerVu equipment, was set for January 31. Ultimately it was extended to February 28. From the 28th until March 11, an estimated 37,500 GWN viewers were without service - those being people who had not taken steps to acquire digital reception equipment. On March 11th, the ABA granted Optus permission to put GWN back up on B-MAC pending resolution of a number of disputes that had arisen between GWN and Optus.

Those are facts. Everything that follows is a matter of opinion; GWN's, Optus's, the ABA's or that of more than 200 viewers and firms impacted by what happened.

The ABA investigation found:

1) GWN was not mindful of "teething problems" (it was the first B-MAC service to actually go to digital) and made poor decisions regarding the length of time it would take to reach existing B-MAC users, talk them into PowerVu, and then get the equipment delivered and installed. The mid-December to end of January original announced simulcast period was complicated by the Christmas holidays and the "wet" or rainy season that stops commerce in NW Western Australia.

2) Scientific Atlanta was unable to deliver decoders as they had promised, in particular rebroadcast sites operated by Shires that had ordered D9223 units were still without even at the end of February.

3) Optus meddled by sending out a large quantity of press releases and dealer advisories which basically told people "*Don't make a decision about trading for PowerVu until you have ALL of the facts - Optus will be available (in mid 1998) with a full line-up of stations including many never to be available on PowerVu* (they meant Westlink, TVSN, Ovation - subsequently killed)." And Optus also told a fib (imagine that) - by telling people "*Don't worry about* (January 31) (February 28) - *GWN will continue to be B-MAC available until the Optus* (Aurora) *service is ready to replace it.*"

The ABA investigation found only one universal thread amongst those interviewed:

"The preference of viewers to receive all broadcasting services using one decoder and their decision to wait until they could genuinely assess the merits of both the Optus and Telstra services."

4) The RTIF scheme was close to the wire in performance. A total of $8 million was provided by RTIF, an additional $3.2 million by Commonwealth agencies. The vouchers did not leave Canberra until January 15th - very close to the original January 31 B-MAC turnoff date, and once in Perth, they still had to be redistributed by GWN to the 3,200 DTH homes and 114 rebroadcast site operators.

There were other factors. The Shire Council rebroadcast site operators were well aware SA could not ship D9223 IRDs, and although D9225s were finally shipped as temporary substitutes late in February, this contributed to the general feeling that even if GWN B-MAC was going to be shut down as announced, ordering a SA IRD was not going to fix the problem. In fact, as of January 15, 1998, SA had only one (!) order for a D9223 for WA. Optus, according to reports, wasted no time advising people that SA IRDs would have to be shipped back to Sydney if they broke but suggested their own IRDs would be "locally serviced." Long after the event, October 1999, SA established a module replacement service programme in WA.

The ABA finds that whereas GWN should have been the "*official information source*" for the status of the digital conversion, Optus "*usurped this role*" by sending out volumes of releases "*allegedly supplying incorrect and misleading information to viewers.*" The ABA further found, "*GWN does not appear to have made any conscious attempt to refute the information being disseminated by Optus and did not engage the position being put out by Optus that viewers need 'do nothing' in preparation for the change.*" And, "*GWN had been largely silent in relation to viewers.*"

There were other nasty confrontations. Optus told GWN it could continue to carry their B-MAC signal "until the Optus Aurora platform is available." GWN said no - you can see why. The longer the B-MAC stayed on the air, the less likely people would in fact make a decision in favour of PowerVu. Worse yet, Optus wanted to charge GWN for this "favour" and in November 1997 "substantially increased the charges to GWN for continued B-MAC delivery." Optus in defence said they were entitled to higher rates because GWN was no longer a "long term contract client." Then Optus decided it would not charge GWN if they agreed to stay up until mid-1998, but should GWN ask only to be on B-MAC until March 31, they would be billed. Ultimately Optus put GWN back up, after receiving special permission from the ABA to do so and following an 11 day period starting March 1 when GWN turned off their B-MAC. We note that Optus was able to do this "*only because of intervention of the ABA*" - in other words, when Optus was "promising" viewers back in December and January that GWN would stay on B-MAC, they had no real legal basis to make this promise. The return of B-MAC, according to the ABA, was only partially successful. "(This) *retransmission by Optus was of poor quality and eventually deteriorated to an almost unwatchable signal.*"

On February 28, when GWN initially left B-MAC, out of 3,200 DTH homes, only 1,261 had installed D9225s. Another 750 were waiting for delivery through Scientific Atlanta, and 745 had not even applied for their RTIF voucher. A token 441 said they were "waiting for Optus to start up."

What do we learn here? GWN was outfoxed by a slick Optus who we now see was not above "fibbing" about the status of B-MAC and their own plans. SA didn't plan properly for receivers and the ABA makes excuses.

THE 2000 SATELLITE EXPLOSION IN THE PACIFIC/ASIA!

Small dish Ku-band ethnic systems developing!

Stay tuned with SatFACTS!

❑ **ENTER** my **12 MONTH** subscription to SatFACTS starting with February 15th issue (rates below)
❑ **ENTER** my **36 MONTH** subscription to SatFACTS starting with February 15th issue (rates below)

NAME _____
Company (if applicable) _____
Mailing address _____
Town/city _____ _____ Country _____

Amount to send: 1 year - NZ$60(inside New Zealand) /A$96 (inside Australia) /US$60 (outside of NZ and Australia) or 3 years - NZ$140/ A$220/ US$150 if by cheque. **VISA** or **Mastercard**? See form below and return with order. Return to: **SatFACTS, PO Box 330, Mangonui, Far North, New Zealand** or if by VISA or Mastercard fax to 64-9-406-1083

IF YOU ARE IN AUSTRALIA - See AV-COMM Pty Ltd Advert p. 31!

USE THIS FORM ONLY WHEN CHARGING ON VISA/MASTERCARD

Please charge my **VISA/Mastercard** as follows:
☐ ONE Year of SatFACTS MONTHLY (NZ$60, A$96, US$60)
☐ THREE Years of SatFACTS MONTHLY (NZ$140, A$220, US$150)
☐ SATELLITE TELEVISION: The Booklet (NZ$10, A$12, US$10)
☐ One Year of COOP'S TECHNOLOGY DIGEST (NZ$125, A$125, US$125)
Indicate charge card type: ☐ VISA ☐ Mastercard

Name (as it appears on **VISA / Mastercard**) _____
VISA/Mastercard Number __ __ __ __ - __ __ __ __ - __ __ __ __ - __ __ __ __
VISA/Mastercard expiration date _____

Instructions: If ordering by mail, return this complete (3-part) card or a copy of same (to **SatFACTS, PO Box 330, Mangonui, Far North, New Zealand**); if order by FAX, send full card as a single sheet to **64-9-406-1083**

ALL COPIES OF SatFACTS Monthly are sent via Air Parcel Post world-wide!

SUPPLEMENTAL MATERIALS from SatFACTS MONTHLY: Order Form

☐ **SATELLITE TELEVISION:** The Booklet. Excellent introduction to home dish ownership for the layman, including major contributions from the father of geostationary satellites - famed science fiction writer *Arthur C. Clarke*. The perfect tool to help the satellite system seller explain home satellite TV to the layman consumer. From SPACE Pacific. NZ$10/ A$12 / US$10, airmail.

☐ **COOP's TECHNOLOGY DIGEST.** For the really serious enthusiast, investor, business person in satellite television and allied leading edge technologies. Ten issues each year, jam-packed with information you will not find anyplace else. "Coop" routinely culls more than 60 publications world-wide, terribly expensive newsletters, Internet and his hundreds of private contacts to keep you right at the leading edge of technology on the REAL changes underway in telecommunications. Conveniently issued near the **first of the month**, creating an excellent time-line-filler between the mid-month issues of SatFACTS. Now in the **6th year,** airmail world-wide. Normally NZ/A/US$250 per year - for SatFACTS subscribers special **50% discounted** price of NZ/A/US$125.

OBSERVER REPORTING FORM - Due February 5, 2000

• NEW programming sources seen since January 1st: _____

_____

• Changes (signal level, transponder, programming content) in pre-existing programming sources since January 1st: _____

_____

• OTHER (including changes in your receiving system): _____

_____

NOTE: Please use P1 - P5 code when describing signal levels and receiver IF/RF settings.

Your Name _____

Town/City _____ _____ _____

Make/size dish _____ LNB _____ Receiver _____

Your email address _____ **if you have one!**

RETURN: SatFACTS, PO Box 330, Mangonui, Far North, NZ, fax 64-9-406-1083, Email Skyking@clear.net.nz

CLIP & SAVE - Loading Austar into a UEC 642 IRD with Aurora in installer test sets

1) Load Aurora channels in normal manner; **2**) Switch to Aurora TV channel 1 (TVSN); **3**) Change Aurora card for the Austar card; **4**) MENU button; **5**) Select "Advanced Options"; **6**) OK button; **7**) Select "Signal Detection"; **8**) OK button; **9**) OK button; **10**) Select "Change Dish Installation"; **11**) OK button; **12**) PIN 9949; **13**) Select "Manual Tuning Parameters"; **14**) OK button; **15**) Set Frequency: 12438, SR 29473, Pol Horizontal, FEC 3/4; **16**) OK button; **17**) MENU button (Austar will now load assuming the polarisation does indeed switch to horizontal and you are pointed at B3).

* When powering down the IRD, it is best to leave the Austar card in the IRD (so that when repowered it loads the Austar channels in the correct order).

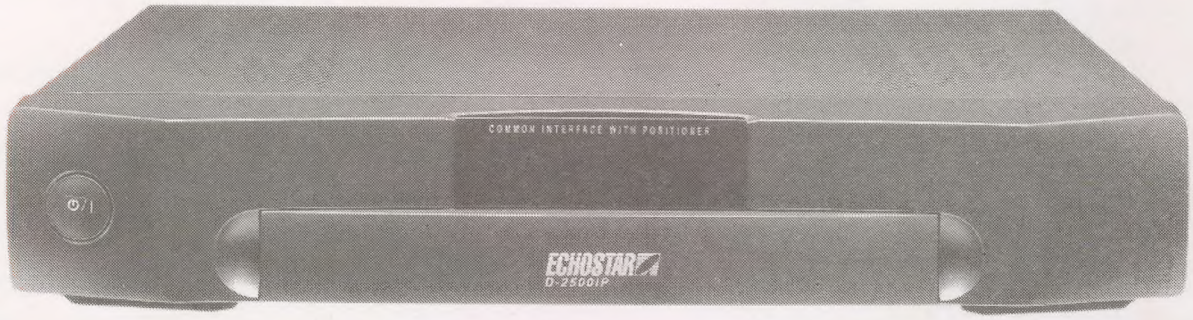
* When changing from an Aurora channel to an Austar channel and the reverse, it is best to change the card first before changing services.

* It is best not to leave the IRD on an Austar channel without the Austar card in the IRD (it will lose channel sequencing).

* If the channel order of Austar does change (i.e. wrong channel; numbers indicated) or some Austar channels disappear, with the Austar card in the IRD, power down and restart.

* To add a third service provider (when and where available): 1) Load factory default settings (to clear out the Austar channels); b) Load the third service provider per steps 2 - 17 above, using the parameters for the new provider at step 15. At the completion of step 17, the new service provider will now load; c) If Austar is also required, add as per steps 2 to 17 above; Note: If the Austar channels are not erased before installing the third service provider, there may be problems with the channel allocations. **(Courtesy SatFACTS Magazine)**

ECHOSTAR



D-2500IP

Full featured Digital Receiver Positioner with Common Interface

Sciteq is proud to introduce the new Echostar D-2500IP MPEG-2/DVB compliant DVB-S IRD with built-in Positioner.

Features include

- Built in Positioner (36V, 5A)
- DVB Common Interface (2 slots)
- Teletext
- 50 satellites
- 2900 channels
- Manual PID entry
- SCPC/MCPC
- Channel naming
- Satellite groups with own skew settings
- Electronic Programme Guide

DVB Common Interface

2 slots, PCMCIA type
(1 and 2 housings)

Tuner/Demodulator

Receiving Freq:	950-2150MHz
IF connector:	F-type 1input, 1 output (loop through)
LNB Control:	0/12V, 13/18V, 22kHz, DiSEqC 1.0, Mechanical and Magnetic Polarizer
Demodulator:	QPSK, C/Ku band
Symbol Rate:	2-45Msym/s

In/Outputs

Scart connectors:	TV, VCR, AUX
Cinch connectors:	Audio L/R, Video
UHF modulator:	CH 21-69, PAL B/G, I, D/K
RS-232:	9-pin D-sub male
SVHS connector	

Quality products distributed by:

SCITEQ
PTY LTD ACN 009 235 090

Phone: +61 8 9306 3738 Fax:+61 8 9306 3737
sales@sciteq.com.au http://www.sciteq.com.au